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The development of a massive open online course during the 2014–15 Ebola virus disease epidemic



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ABSTRACT

Purpose: Timely training was urgently needed at the onset of the 2014 Ebola virus disease epidemic. Massive open online courses (MOOCs) have grown in popularity, though little is known about their utility in time-sensitive situations, including infectious disease outbreaks.

Methods: We created the first English language massive open online course on Ebola virus disease. Designed by a team representing various units of Emory University and six partner institutions, the six module course was aimed at a global general audience but also relevant for health care professionals.

Results: Over 7,000 learners from 170 countries participated in the initial course offering. More than a third of learners were from emerging economies, including seven percent from Africa, and another 13% from countries outside the United States who received individuals requiring treatment for Ebola virus disease.

Conclusions: Creating and producing the first English language MOOC on EVD in a short time period required effective collaboration and strong coordination between subject matter and course development experts from Emory. Through these collaborative efforts, the development team was able to provide urgently needed training and educational materials while the epidemic of EVD continued to radiate through West Africa.

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Background

Since the onset of the 2014 Ebola virus disease (EVD) epidemic, a plethora of related academic and field research has taken place [1,2]. However, global access to comprehensive training on the history, clinical presentation and management, sequelae, and public health implications of EVD were urgently needed as the outbreak evolved [3,4]. The Global Outbreak Alert and Response Network called for institutions to build capacity to respond to outbreaks [5]. After several patients were evacuated from West Africa and successfully treated in the Emory University Hospital's Serious Communicable Diseases Unit (SCDU), Emory was particularly well-positioned to provide training on this topic.

In recent years, massive open online courses (MOOCs) have been growing in popularity among the general population, though little

is known about their utility in time-sensitive situations such as infectious disease outbreaks [6–9]. A French language MOOC on EVD launched at the end of 2014 set the stage to test the use of MOOCs under these circumstances [6]. Both courses utilized a public health approach in examining the disease including epidemiologic and social factors impacting population health. Our course drew on the experience of treating EVD-infected patients in the Emory University hospital. Given the presence of EVD in both French- and English-speaking West Africa and the global predominance of English, there was an urgent need for English language training on the subject [6].

Coursera—one MOOC platform—currently offers 1,858 courses to a global audience. These courses are considered continuing education and not typically offered for academic credit. Coursera has 147 partners including universities, corporations, nonprofit organizations, and international agencies. Emory University and Coursera entered a partnership in 2013; Emory University is among the academic institutions that provides MOOCs through Coursera. The subject matter for MOOCs is at the discretion of each university although Coursera provides a review before courses are launched. Here, we describe the development and evaluation of the first

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English language MOOC on EVD as the 2014–15 epidemic was ongoing.

Pedagogical objectives

The goal of the course was for learners to understand the evolving EVD epidemic and its various aspects including disease prevention, management and treatment, response to the epidemic, ethical considerations, and the post-EVD global health landscape.

Course development and production

At the suggestion of the Emory University Provost, the course, 'Ebola Virus Disease: An Evolving Epidemic' (www.coursera.org/learn/ebola-virus#), was designed by two faculty members whose primary appointments are in the Hubert Department of Global Health at the Rollins School of Public Health (RSPH). The target audience was the general public, but it was expected that many learners with medical, nursing, or public health backgrounds would also utilize the course.

Course design took place from October 2014 to February 2015 (Fig. 1). Faculty instructors began by developing a rough course outline. Next, they identified content experts, namely faculty across academic units who could serve as presenters on each topic (Table 1). High-marquee speakers included a former President of the United States of America, the Director of the National Institutes of Allergy Immunology and Infectious Diseases, the founder of Partners in Health, and an EVD survivor/infectious disease physician; two of these speakers filmed at remote locations. All speakers were recruited for participation in the course via personal, professional, and/or organizational networks.

The Teaching & Learning Technologies team (a part of Emory Libraries & Information Technology and funded by the Office of the Provost) coordinated course production. The team included an instructional designer (ID), videographer, editor, and two production specialists. Each speaker developed their own set of instructional materials and identified open-access readings which were then reviewed by faculty instructors. Once finalized, faculty

instructors shared content with the ID for technical review in consideration of the Coursera format. The ID guided faculty in effective pedagogical practices for online content. Examples of such strategies included selecting instructional methodologies for a global audience, designing meaningful activities and learner assessments, and ensuring that the creation of materials aligned with course objectives. A major facilitator to course production was Emory University's Office of the Provost. Although scheduling multiple high-profile speakers was challenging, it was not a major barrier to production. The same standards of instructional design were used as for nontime-sensitive courses. A promotional trailer for the course was produced and distributed on the Coursera platform for marketing purposes.

The course launched in March 2015. Learners could participate in the course either for free or at a minimal cost via the Signature Track. That track provides learners with an individualized verified certificate on successful completion of the course.

Instructional content and evaluation

The course consisted of six modules with between four to six video lesson segments each. Module formats included individual lectures, panel discussions, and accompanying PowerPoint presentations. In many instances, videos included in-video questions or reflections which served as self-checks for learners and generally appeared at the end of each video to highlight important points of each lecture. Modules were time-released through the Coursera platform and learners were required to complete the modules in sequence over a six-week period.

Each module included open-access readings/resources and discussion board questions. Discussion boards were monitored by the ID and course instructors provided input as needed. Comprehension quizzes with between 9 and 11 questions were developed for the first five modules using true/false, closed ended, and multiple-choice questions. Grades were calculated based on quizzes and participation in discussion boards. Quizzes were averaged and accounted for 90% of the grade. The other 10% was based on discussion posts; six were required to earn full credit. A final

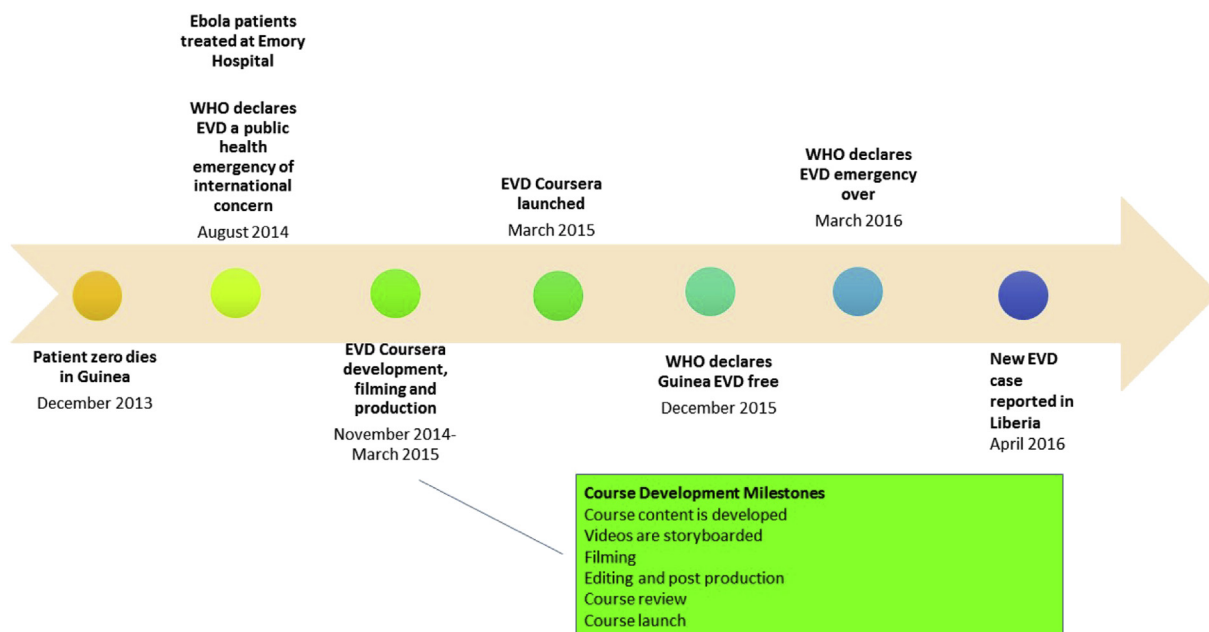


Fig. 1. Major Events in the 2014–2015 Ebola virus disease epidemic and Coursera development.

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