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# Design and Development of Online Courses on EdX Platform

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**Abstract.** Educational technologies, like distance learning, is developing rapidly and that development has presented educators with an opportunity to rethink and improve their pedagogical practices. Concept of massive open online courses (MOOC) become a recent and widely researched development in distance education. In the paper we introduce you to principles and practices of online course development on edX platform.

**Keywords:** MOOC, edX, open education, distance learning.

## 1 Introduction

There was an explosion of popularity massive open online courses in 2012, or abbreviated MOOC, The New York Times called this year as The Year of the MOOC [1]. It was connected with the advent of such open educational resources as edX, Coursera, Udacity and Khan Academy in the Internet. Coursera after the launch in January of 2012 to November of the same year reached more than 1.7 million subscribers – growing faster than Facebook. Many of the top level universities in the world have started to present their open courses in MOOC platforms in order to attract the best potential students and demonstrate their best courses to the wide range of users registered there. Leading universities in many countries began to develop their MOOC resources and contents, including Al-Farabi Kazakh National University.

On June 1, 2013, edX developers open sourced its entire platform. It is expected that due to the open source platform users will make it improve. Stanford University and Google became the main participants of the project with open source software, called Open edX. Google developed the site MOOC.org for everyone to post their courses, which uses the Open edX. At the end of 2013 China's universities have teamed up to organize a site for online education in China, called XuetangX. 120 high schools in France under the guidance of the Ministry of Education of France teamed up to create a national portal for online education. Queen Rania Foundation for Education and Development created Edraak – first MOOC portal in the Arab world. The International Monetary Fund has created a pilot site for online courses on economics and finance, and they all use the Open edX platform.

Here some of the features of the Open edX platform:

- molecules editor;
- code sandbox (Python, Matlab, Java);
- simulator of electrical circuits;
- Protein builder;
- interactive tables and charts;
- assessment of essays by machine learning algorithms;
- peer-to-peer assessment;
- L<sup>A</sup>T<sub>E</sub>X support;
- mobile applications support;
- analytics and other.

According to the accepted concept of development of the system of distance education in Al-Farabi KazNU, we began to implement the global experience of distance learning technologies (DLT), so we chose Open edX platform to organize online courses [2]. Currently the recent version of the system is installed and a few courses is partially downloaded. These courses are developed for students and the Virtual Academy pupils by the teaching staff and the Center of distance education. In addition to the Virtual Academy there is planned to gradually fill up content by courses for external students and students on academic mobility, as well as video recordings of open courses of summer semester and lectures of visiting professors. The main objectives of this initiative is:

- development of the DLT in accordance with modern global trends;
- gratification of the demand for high-quality educational services to the University (preparation of students, educational programs, higher education, training, retraining);
- participation of the University in uniform educational space of the international community, including the exchange and use of the full range of open resources, interaction with other members of the global educational system;
- overcoming regional barriers to learning in the University and access to education for all segments of the population;
- integration of the DLT for all kinds of forms of training in order to increase their effectiveness;
- introduction of modern tools of education quality control;
- expansion of the main activities of the University.

## 2 Phases of Creating an edX Course

In edX the process of creating an online course can be divided into five phases:

### *Phase 1: Getting the Word Out*

This section covers what a course "About Page" is, why you need one, and what you need to provide if you want your About Page to stand out from the crowd. This section also covers additional methods of promoting your course.

### *Phase 2: Creating course content*

This section covers the rationale behind the structure of the edX interface, the strategy of designing a learning sequence, the building blocks of an online course, and the necessity of creating accessible content. It also covers best practices on modes of video capture and how to structure course content to ensure learners are actively engaging with your course.

### *Phase 3: Creating a grading policy*

This section covers how to establish a grading policy by defining the due date and relative weights of assignment types such as homework, labs, midterms, and final exams. It also covers the tools you and your learners use to monitor learner progress in the course.

### *Phase 4: Preparing a course for delivery*

This section covers creating a course syllabus and creating a course schedule. This section also covers communication basics such as creating a welcome announcement, creating a welcome e-mail, and general guidelines for e-mails to learners.

### *Phase 5: Course delivery*

This section covers course discussion moderation, verified certificates, and research and analytics.

## 2.1 Getting the Word Out

At the beginning to plan and design online course, it is important to develop a strategy for getting the word out about this course. An “About This Course” page (or About Page) is an advertisement for the course, composed of materials you provide to edX. The goal of the course About Page is to sell learners on why they should take this course. In figure 1 annotated course About Page is provided.

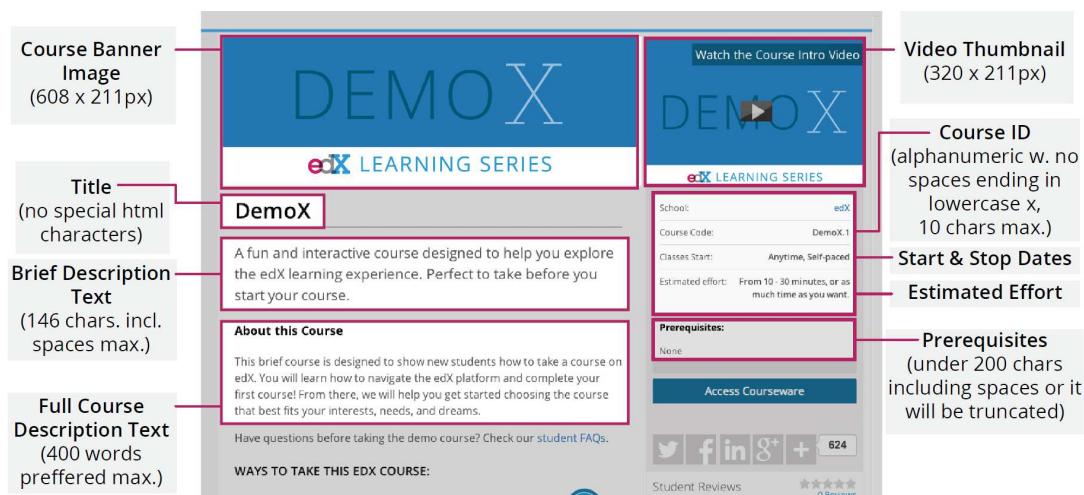


Fig. 1. Annotated course About Page

Typically, they publishes the page on the website several months before the course begins so that learners can understand what the course is about, when it is offered, and the level of effort required. This helps learners decide whether to enroll in the course.

When you prepare the text for your course description, you should ask yourself who the course is designed for and write in a tone that matches the target audience. Remember that these learners are not required to take a course as part of a major or as a required elective. They likely haven't heard from their friends which is a good course to take or which to avoid. About Page descriptions should be welcoming, energized, and—to a certain degree—provocative.

This may sound a bit vague, but think about asking questions in your About Page description to engage the reader. Avoid repetitively using “this course includes” or “assignments include.” Talk about why the field or subject matter is exciting and what learners will create or be able to do, either through assignments or interactive labs.

The heart and soul of the About Page is the About video. For learners who are casually browsing edX, it is your way to stand out from the crowd and drive enrollment. Think of it as a movie trailer for your course. About videos should be 1-3 minutes long, and should make learners want to take your course. Courses with About videos have higher enrollment rates.

The About Page and About Video are two powerful ways to promote your course. There are numerous additional ways to ensure that learners are aware of and excited about your course. Use your institutional resources and networks, like institutional home page or publications such as newsletters, newspapers, and magazines; or you can use social media such as Facebook, Vkontakte and Twitter for promoting your course, driving enrollments, and engaging registered learners. Another great way to promote your course is to reach out to individuals and organizations within your professional network who may be interested in sharing news about your MOOC. For

instance, you can connect with instructors who teach related courses at your or other institutions, asking them to reach out to their students and contacts with information about your course.

## 2.2 Creating course content

Content is presented to learners in many ways on the edX platform, and the way learners engage with this content is the learning sequence: a set of interwoven videos, readings, exercises and discussions that cover a specific topic. The purpose of learning sequences is to promote active learning.

Interspersing exercises into the content of your course enables learners to apply the knowledge gained before proceeding to other material, thereby promoting active engagement by the learner. These exercises can be brief, ungraded questions. The value is that the instant feedback gives the learner confidence that they have understood the material they were just presented.

A learning sequence might start with a video reviewing material covered in the previous learning sequence. You might also choose to end a learning sequence with a video summarizing what you have just covered. The possibilities of how you structure your content are endless, and the choice is totally up to you. A lecture is often an hour-long exposition of a concept. Online learning exercises create an interactive experience that allows the learner to get immediate feedback on their progress through the material.

For an online course, we recommend dividing lectures into modular, bite-sized videos. Ideally, videos should be 3 minutes to 7 minutes in length and as modular or standalone as possible. Independent research on videos in MOOCs, conducted by University of Rochester professor Phillip Guo and which is summarized [3], found that shorter videos are much more engaging than longer ones. Finally, you can insert a discussion topic after each video and exercise so that learners can discuss the material with others who have also recently gone through this material. This local discussion topic, embedded in the learning sequence, will also appear in the course discussion forum, which we will cover later.

There are four main content building blocks you can use to build your course. These may not sound like a lot, but within these four building blocks there are a wide range of possibilities (fig. 2).

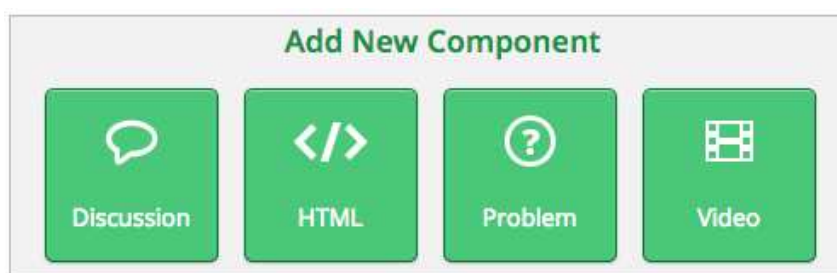


Fig. 2. Component adding menu

**HTML:** This is both the most basic content type and the most versatile. You can add rich text, images, links, and more.

**Discussions:** Allow for learners to engage in course discussions that are embedded within the natural flow of a course.

**Problems:** edX offers a wide variety of out of the box problem types, as well as the ability to create and customize more advanced problem types.

**Videos:** edX's built-in video player possesses many features to optimize the learner experience.

### 2.3 Creating a grading policy

Establishing the grading policy for your class is an important aspect of course design. The edX platform gives you considerable control over the exact nature of the grading policy. As you can see below, you can adjust grade ranges, change the names of grades (for instance, you can change a letter grade of "A" to the word "Excellent"), and decide on the number of possible grades.

It is important to note though that if your course offers students the opportunity to earn a certificate, any student earning a grade over the "F" or "Fail" threshold will qualify for a certificate. This is true regardless of how many grade levels you add in the grade range. Thus, when establishing your grading policy it's important to consider where you want to set the bar for receiving a certificate.



Fig. 3. Grading scale

For each graded assignment in your course, you can specify a release date and time when learners can first access the assignment, as well as a due date and time at which point the assignment is closed. You also have the ability to apply a grace period on all assignment due dates in order to give students some additional leeway.

### 2.4 Preparing a course for delivery

Much like in an on-campus course, the preliminary course material is the logistical scaffolding of an edX course. These are a set of introductory materials that learners view when they first enter a course, and are not unlike the administrative material you might hand out on the first day of a campus class.

Preliminary course material can include:

- A syllabus
- A course schedule
- Any specific collaboration or course discussion guidelines
- A welcome announcement on the Course Info page and future announcements
- A welcome email and future email communications

The Course Info page is the first page that learners see when they access your course. It's a very good idea to create a welcome announcement on the Course Info page to serve as a landing pad for new learners and to provide guidance and instructions about the first steps learners should take. The welcome announcement should encourage learners to check out the syllabus page, inform them about course discussions, and tell them what is available for viewing. Some instructors have also pointed to a self-diagnostic quiz and material to help learners make sure

they're prepared for the course. In addition to a welcome announcement at the beginning of your course, we encourage you to post a regular stream of announcements on the Course Info page throughout the course.

While your Course Info page serves as home base for disseminating information directly to your learners, we recommend that you also send crafted e-mails before and during the course. To ensure that your learners are engaged and responsive, we recommend that your e-mail communications be brief and to the point. Personal e-mails such as these will increase the likelihood learners will complete your course. Usage may vary, but we recommend outreach to learners two months, one month, one week, and one day before your course begins.

## 2.5 Course delivery

The final phase of creating and launching an edX course is course delivery. Course delivery includes actively monitoring discussion forums, communicating with learners via e-mail and other channels, monitoring student activity and performance, and awarding students certificates.

Student collaboration through course discussions and other channels are an integral part of the MOOC experience. Yet not all learners have experience participating in online discussions and other forms of online collaboration. Offering guidelines for collaboration encourages your learners to help each other learn. Likewise, discussion guidelines can give your worldwide audience an idea of the types of conversations you would like to foster in the forums.

The edX Insights feature makes information about courses available to course team members who have the Course Staff or Instructor role [4]. edX Insights provides these course team members with data about learner backgrounds and activities throughout the course. Using edX Insights can help you validate the choices you made in designing your course. It can also help you re-evaluate choices and inform efforts to improve your course and the experience of your learners.

## 3 Conclusion

Creating online course is a very complex and interesting process that requires careful structuring of the course material and design of high quality content. In the near future, online courses can be an important part of the educational process in secondary and higher educational institutions. In these circumstances, all teachers will have to learn the skills to create online courses that will help them to find students worldwide.

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