

The edX Platform: A Critical Examination as Viewed Through the Lens of the 7 Principles

Mark A. Bates

University of British Columbia

Introduction

This article presents the results of a critical examination of the edX platform in respect to its ability to facilitate online best practices for professional education and graduate studies (Bates, 2015). To that end, existing and planned functionality will be assessed against the recommendations of Chickering and Ehrmann's *Implementing the 7 Principles: Technology as Lever* (1996).

General Overview of EdX

In May 2013, MIT and Harvard launched EdX, a non-profit open source learning platform (openedX.org) and web portal (edX.org) offering Massive Online Open Courses (xMOOCs) similar to its for-profit competitors; Udacity and Coursera (for-profit) (EdX, 2015b) (MIT News Office, 2012). xMOOCs are characterized as online education courses that are usually, often do not require any prerequisites, are typically housed within a learning management system, have a very large number of students, are open to learners globally and accessible online twenty-four hours a day seven days a week. xMOOCs typically are structured to guide students through content using a combination of video lectures, quizzes, readings and social interaction via discussion forums, as well as, utilize automated or self and peer-graded evaluations (Welsh & Dragusin, 2013; Claros, Garmendia, Echeverria, & Cobos, 2014; Liyanagunawardena, Adams, & Williams, 2013).

Based in Cambridge, Massachusetts, EdX continues to be governed by MIT and Harvard with the aim to “become a learning resource for learners and learning worldwide” by staying committed to its goals: “Expand access to education for everyone, Enhance teaching and learning on campus and online, [and] Advance teaching and learning through research.” (EdX, 2015a).

In addition, EdX conducts research on how students learn, online teaching methods and impact of educational technology use both in the traditional brick and mortar classroom and online.

Today, EdX offer online courses from 36 universities, NGOs, foundations, businesses and organizations which work collaboratively and comprise the consortium. EdX's remains in start-up mode, and apart from the initial funding of 30 million contributed by each Harvard and MIT revenue is generated through various affiliate partner models (Kolowich, 2013).

Management and administration of EdX falls to three groups including the Leadership Team, headed from the beginning by Chief Executive Officer Anant Agarwal who, amongst various achievements, has great experience with computer technology as a professor at MIT and entrepreneur. In addition to a Leadership Team, EdX is also supported by a Board of Directors comprised mainly of representatives of MIT and Harvard (EdX, 2015d). More diversity is seen within the final group, the University Advisory Board, which has broader global institutional representation across North America, Europe and Australia (EdX, 2015c).

Overview of Examination Tool: Chickering & Ehrmann's 7 Principles

Certain tools are available to assist organizations to better keep pedagogy in the forefront when selecting technology such as Chickering and Ehrmann's (1996) 7 Principles. These principles are a means to ensure technology is being used in the most cost effective and appropriate ways to advance learning outcomes or tasks such as; 1. Encourages contact between students and faculty, 2. Develops reciprocity and cooperation among students, 3. Uses active learning techniques, 4. Gives prompt feedback, 5. Emphasises time on task, 6. Communicates high expectation, and 7. Respects diverse talents and ways of learning. By utilizing this type of tool, a methodical and replicable process can be applied to compare different platform technologies in a way that goes beyond a simple comparison of features and tools.

Functionality and Affordances in Support of the 7 Principles

The initial research involved a three stage review of: 1) available online documentation as provided publically by edX on edx.org and open.edx.org, 2) including several edX courses (edX, 2015u; edX, 2015v; edX, 2015q) and Charter Members (Berkeley University of California, 2015; Cornell University, 2015; Harvard University, 2015) , 3) and various public websites as a result of keyword searches using Google. After the review was completed and affordances noted, the article was then structured as follows with each principle, along with a brief overview, is presented and how the affordances of the EdX platform either are or have the potential to promote that principle.. However, given that there were overlaps between some of the features and principles, attempts have been made to make note of these occurrences and then a best fit was completed to conform to the paper's overall structure.

One of the affordances of EdX is its ability to be used creatively, which makes its evaluation difficult as it is beyond this article's scope to present all variations. In addition, only a small sample of courses were reviewed for this article and, as such, the results of this examination cannot be viewed as indicative of all edX courses. Some courses will do a more effective job than others of utilizing the affordances available via the edX platform. Also given the limited scope of this investigation, only those features that can directly be related and support the 7 Principles have been described. Some of the affordances presented are obvious in nature while others run in the background as part of the overall design and might not even be visible to the instructor. Unless otherwise noted, the affordances noted are existing and currently active on the edX platform. Therefore the findings and observations presented are general in nature and are a starting point for further investigation.

1. Good Practice Encourages Contacts Between Students and Faculty

Overview of principle. Contact between students and faculty is a key factor for increased learner motivation and involvement within a course. This interaction can be strengthened through the affordances provided by an online environment. The nature of contact can take several forms including the sharing of useful resources, discussion leading to joint problem solving and shared learning. In online environments such as MOOCs, various aspects of the instructor's role in the communication process can be undertaken by a student or peers as a means to counter constraints.

Affordances found within EdX which promote principle. Courses created for EdX, can support good practice encouraging contacts between students and faculty by:

- Embedding instances of Google Drive and Google Calendar to share quiz dates, office hours, files, etc. (edx, 2015e) between instructors and students.
- Detailing on the course homepage (Figure 1- Course Page, the prerequisites and or necessary entrance exams which are required prior to enrollment. By doing so, students understand what prior knowledge is required to be successful in the course and instructors have a level of certainty regarding student capabilities on entry to the course (edx, 2015f). In addition to any prerequisites, all course instructors have the ability to indicate the level of difficulty, estimated length of time for the course, amount of weekly effort required, institution offering the course, the language being used, as well as the price, if any. By communicating such information to students in a consistent manner across courses students are better able to make comparisons and effective choices.
- Having students create customized learner profiles that are sharable within edX. Such profiles allow students, their peers and instructors to develop relationships in the edX

community based on common interests (edx, 2015g). edX also provides ability for instructors to add their own profile for students to read including biographic information, research interest and other courses taught.

- Accessing floating help tab to the left of the screen in the course's user interface. Once clicked, a student can report a problem, make a suggestion, ask a question, click links to course discussion forum or the edX frequently asked question page. Apart from the tab, students can also access the edX Guide for Students (edXw, 2015).
- Listing social media accounts, such as Twitter and Facebook, used within the course to help facilitate communication and discussion. edX also lists its various social media accounts including Facebook, Twitter, LinkedIn, Google+, Tumblr, Meetup, Reddit and YouTube.
- Generating learning analytics as students move about the site, interact with the content and complete assessments. One such tool in the planning state is per-video activity report (Figure 2 - edX Insights Video Analytics) which will give analytics on videos via edX Insights and help instructors determine if a particular video is useful to learners or not (edx, 2015k).

2. Good Practice Develops Reciprocity and Cooperation among Students

Overview of principle. As with encouraging contact between students and the instructor, the development of reciprocity and cooperation among students is important as it deepens the learner's understanding with the sharing of thoughts and feeling as they respond to others. Courses should be designed that provide students with access to communication tools that facilitate activities that promote interaction, collaboration, discussion and group problem solving.

In an online environment, geographic location is not as limited with the use of collaborative tools such as texting, email, chat and social media.

Affordances within EdX which promote principle. Courses created for EdX, can support good practice developing reciprocity and cooperation among students by:

- Utilizing cohort-specific discussion experiences or interaction amongst the small course community (edx, 2015h). This can be further broken down by assigning members of a cohort to smaller groups based on distinct characteristics, or an automated, random process as a means to strengthen collaboration and communication dynamics (edx, 2015h).
- Using discussion forums that can be made easily accessible to students via the horizontal course menu. Posts can be categorized by the student as a question or a discussion, can be voted on, followed, reported for inappropriateness, pinned and, if a question, can be marked by originator or admin as answered (edx, 2015i).
- Promoting the use of social media tools like Meetup, Facebook, Twitter, Google+, YouTube, Sennseis (Berkeley University of California, 2015), and Slack (Harvard University, 2015).
- Using former students as Community TAs (Berkeley University of California, 2015) to provide support.

3. Good Practice Uses Active Learning Techniques

Overview of principle. With proper and thoughtful selection, technology can have positive effects for the learning community and support other best practices such as encourage active learning (Chickering & Ehrmann, 1996) and appeal to greater learning styles (Tonsing-Meyer, 2013; McGee & Reis, 2012). Active learning occurs when students are provided opportunities

to talk about their learning, write in a reflective manner, relate learning to past experiences and do so in a way that is relevant so that they can apply it to their daily lives. To encourage active learning, an instructor must make available tools and resources that promote learning by doing, offer time-delayed exchange as well as real time conversation to take place between learning community members.

Affordances within EdX which promote principle. Courses created for EdX, can support good practice use active learning techniques by:

- Providing course developers with the ability to integrate interactive, dynamic content through LTI, API, XBlocks, and JavaScript applications. Learning Tools Interoperability or LTI (IMS Global, 2015) benefits students with access to interactive LTI services within the edX platform without the need for a separate site or login. Instructors benefit from the use of LTIs as they can add and extend interactive features not natively present within edX to their course via securely linked applications of their own or choose from existing certified products (IMS Global, 2015b). Examples include HMH Portfolio (SchoolChapters, Inc., 2014) which provide students with a portfolio accessible in a LMS but separate so that it can travel with them, Google Course Builder (Google.com, n.d.) which is working with edX on app integration, Cattura Video (Cattura, 2014) integrates with Google products and allows instructors to make videos from Chrome that connect to course and Office Hours (Office Hours, n.d.) connects classmates to each other as well as their certified teaching assistants.
- XBlocks are integral to edX's component architecture and, as with LTIs, provide flexibility when designing a course, providing the ability to add sources from a variety of

areas. XBlocks's structure allow web applications, course content, APIs to communicate and access data (edx, 2015j).

4. Good Practice Gives Prompt Feedback

Overview of principle. The amount and type of feedback required by students is seen as a continuum. Initially, students need help assessing knowledge and competency, later they require frequent opportunities to perform learned tasks and get feedback and finally, they need the opportunity to reflect on what they still need to know and how best to get there. There are many types of technologies that support feedback such as email, simulations, video recordings of learner performance, editing and commenting tools like those found in Google Docs and MS Word, and portfolios.

Affordances within EdX which promote principle. Courses created for EdX, can support good practice for prompt feedback for students such as:

- During quizzes and various types of assessment, instant feedback is provided via an auto-grader including hints.
- Assignments that are peer graded give feedback in lieu of automation.
- Viewing course progress in the course's Progress tab provides students with their assessment results in both graphic and textual formats.
- edX provides its Insights tool (edX, 2015r) to course instructors displaying student data in a variety of ways to assist in assessing performance. Insights can:
 - Assess the difficulty of graded problems.
 - Determine the completeness of questions and answers.

- Display visualizations, metrics, and tables to present data including how students interact with the content (Figure 4- Correct vs Incorrect Answers as viewed from edX Insights and student demographic data.
- Show the answers to ungraded problems so that instructors can possibly gain insight into course quality and learner preparedness (edX, 2015s).

5. Good Practice Emphasizes Time on Task

Overview of Principle. For graduate students and those accessing professional education, time management is an important consideration when taking a course as it plays a primary role in achieving an acceptable form of work-life balance. Students can become more efficient in the management of their time with access to various types of technologies and support through teaching strategies.

Affordances within EdX which promote principle. Courses created for EdX, can support good practice emphasizing time on task.

- From a learner's initial interest in perusing graduate or professional education through edX, they can use the search and browse feature to quickly drill down results by course name, school, subject, availability or type (edx, 2015l). In addition, students are able to audit courses and review contents, including the syllabus, to better determine if the course is of value or fits other work-life balance requirements.
- Once ready to register or login, students can use their existing Facebook and Google account instead of creating another online identity (edx, 2015m) and speed up the process of accessing a course.
- edX uses an active-learning method of modular course design that utilizes a combination of text, video, and exercises. This pattern adds consistency across courses and assists

students in better predicting the necessary movements as they navigate through the contents.

- EdX supports the use of shorter instructional videos and provide tools to add transcripts that also function as bookmarks to jump to specific points in the video.
- As mentioned in several prior sections, although there are many combination of affordances available to the instructor for use in the course, edX enforces some best practices in the way it limits designers from being able to change the end user interface. By ensuring that all course have a similar structure, students are able to move between courses in a more expedient manner with less time dedicated to learning how to move about, access content, etc. Also, a level of quality, in respect to some basic best practices for online education, can be achieved through such scaffolding. Each course is created using edX Studio (Figure 6- Course Outline in edX Studio Figure 7- Course Home as viewed in edX Studio and has a defined layout that maximizes space, and utilizes components like menus, tabs, and accordions that simplify navigation. For example, all courses appear to have the following sections:
 - An introductory course page that provides a video overview along accompanied by a text description providing further details including what a student will learn.
 - Once registered students can access the course site (Figure 5- Student GUI of Course Site which is comprised of:
 - A header with the hyperlinked edX logo and course title in the upper left corner and a button for access of user specific info (e.g. account settings, profile and sign-out) in the upper right.

- Beneath the header is a tabbed horizontal menu linking to courseware (course content), course info, discussion, wiki, and progress. It appears that these titles can be hidden but for consistency, the text cannot be changed unless custom pages are created.
- Under the menu, is a central panel which displays content chosen from either the horizontal or vertical menu. The panel has its own horizontally scrolling menu with icons that assist the student moving through the content. There are also navigational arrow buttons at bottom to move back and forward.
- To the right of the central panel is a sidebar that is customizable with various labels and associated sections such as events, resources, and course handouts.
 - To the left of the central panel is another sidebar and typically displays an accordion submenu on selection of courseware from the horizontal menu.
 - As mentioned in a prior section, there is also a floating help tab on far left screen margin.

6. Good Practice Communicates High Expectations

Overview of principle. Chickering and Ehrman (1996) indicate that “expecting [all] students to perform well becomes a self-fulfilling prophecy” but the expectations must be made explicit and clear to students. Learners can only hit targets which can be seen. Technology can be used in a variety of ways to communicate expectations from providing details on how student work will be evaluated, provision of product and performance exemplars, to publishing student work online.

Affordances within EdX which promote principle. Courses created for EdX, can support good practice communicating high expectations. EdX uses agreements between itself and the potential student as a means of communicating and seeking compliance regarding high expectations. From the beginning, and at the base level, these documents attempt to weed out any students who question the responsibilities expected of them or edX. In short, they are told if they don't understand or agree to follow what is stated then they are not to use the site.

There are 3 key documents that communicate high expectations:

1. The *Terms of Service* (edx, 2015n) indicate students are not to act in a way that is illegal including engaging in behaviors that are defamatory, harassing, threatening, infringe copyright, overtly political, commercial, and indecent. Students are not to work purposefully to negatively impact edX servers and participants, or misrepresent their identity.
2. The *Privacy Policy* (edX, 2015y), that in addition to noting how students are to act, also lays out how edX will deal with issues such as how student's data and personal information will be used, what are their rights, how do they give consent, and its rationale.
3. Students must agree to follow the *Honor Code Pledge* (edx, 2015n) in order to participate in a course in addition to any additional terms noted in each course. Student are expected to collaborate, discuss and present with the understanding it will be commented and criticized in a scholarly manner. Other expectations include only submitting their own work, not being dishonest, and not posting answers that are part of an assessment.

7. Good Practice Respects Diverse Talents and Ways of Learning

Overview of principle. Students should be given opportunity to use their preferred learning style in completion of assignments and accessing of content but also be challenged to develop others with the goal of being better rounded as a learner. Technology should not only allow for customization of the types of assignments students complete but allow for self-paced movement through the course and means to form social groups with similar goals, motivations and skills.

Affordances within EdX which promote principle. Courses within edX, can support good practice respecting diverse talents and ways of learning.

- As a way to respect the talents of learners, edX has LinkedIn profile integration to display certificates (edX, 2015q). In the future, edX plans to also provide socially shared certificates and courses to students via their Facebook Wall.
- Quizzes and tests offer a variety of different types and feedback options that respect different ways of learning, including:
 - multiple choice, check box, dropdown
 - image mapped input, drag and drop
 - text put/fil-in-the-clank, numerical input/enter a number
 - math expression input
 - peer assessment / open response assessment
 - in addition, learners can upload image with text to provide further explanation.
- edX recently released a mobile companion app for Android and iPhone devices that allow students to read announcements and handouts, download video lectures for viewing later without the need for an Internet connection.

- Course content can be provided, in its very basic form, in text. However, the affordances of the platform allow for additional media such as video and audio. With the use of LTIs and JavaScript apps, an increased amount of services can be utilized and integrated to add interactivity and multiple ways of responding.
- Students can choose a self-paced model of learning or make connects with others in the real world to explore a more collaborative process.

Discussion Regarding Constraints of edX Platform in Relation to the 7 Principles

Constraints tend to fall into those found and facing all MOOC providers such as ensuring equity, access and mobility to all students. Given this is an examination of the edX platform and not a single course produced by it, there were few constraints of note after completing the examination focusing on affordances.

Good Practice Develops Reciprocity and Cooperation Among Students

- Although students can look for support and answers to questions by reading about the experiences of other learners who have gone through edX using social media resources such as edX Stories on Tumblr (edX, 2015), there are no official student-driven resources. Students would benefit from services such as a wiki or Quora-style (Quora, 2015) forum linked on the main destination site to offer help that is not specific to a single course. In addition, although students do have access to course based discussion forums with the ability to vote in favor of a post and follow other students, there is no system in place that could add a valuable reputation points system. Such a system would provide learners with another tool to better drill down worthy information.

- With the recent edX release of the Birch version of its platform, students have some more options in regards to information displayed in their profile. But even with the upgrade, edX profiles still lack features in comparison to other profile offerings from such services like Twitter or Google. Students should have the ability to easily add other social profiles, share links, display course certificates that make it easier to determine if making connections with specific users is a worthwhile investment.

Good Practice Communicates High Expectations

- At the present, student are told to read the Terms of Service, Privacy Policy and Honor Code. However, it would add a high level of commitment if student were required to complete a statement indicating each had been read and understood. To further strengthen commitment, courses could be required to ask for these digital signatures to that effect when starting a course.
- Currently, students must check back to see changes in the above documents. A better practice would be for them to be notified via their profile's communication preferences when those pages are updated and then be required to digitally resign.

Good Practice Uses Active Learning Techniques

- Although Student Notes is a pending edX feature it is best noted here until the point of it being public. This feature will allow students to add personal annotation to course content and be accessible via the new Notes tab within the menu system or by returning to the content where note was made.
- Although external services can be embedded into course content pages, the process can still be streamlined from the current need to copy code from one area and paste into

another. This could be done through the creation of short code and its insertion right from within the HTML editor in edX Studio. The benefit to students is that instructors and designers may be more willing and able to add interactive features.

Good Practice Respects Diverse Talents And Way Of Learning

- edX's Accessibility Guidelines are on-going (edx, 2015o) and are focused on making improvements to learner facing interfaces in order to make them increasingly compliant with web accessibility best practices. edX is making efforts to change currently policies and guides so that they are more practical for course developers in areas such as semantic markup, testing code for accessibility and the labeling form elements.
- At present, the majority of courses on edX are in English which can be a barrier to access for students who have a different mother tongue. edX could look for ways to develop and implement increase translation services (e.g. on-demand) that go beyond offer a multi-language transcript of a video's content. Not only is there the need for the translation of the course content but a service that can also take the non-English student's product and have it readable in other languages for assessment and collaboration purposes. However, it should be noted that another pending feature, in addition to a more responsive destination site (edX.org), are plans to support right to left language support on the platform(edX, 2015p).

Good Practice Encourages Contacts Between Students and Faculty

- Recently, edX launch its mobile app for both Android and iOS devices. Constraints at this time are, for the most part, features listed as pending and include the ability for students to register, create a new account, and receive adaptive video quality based on

bandwidth quality changes. However, the app in itself, does not fully address the situation where students are limited or unable to access edX due to the multimedia nature of the content and its technological and financial requirements such as bandwidth and storage.

- Currently, YouTube hosts the video offered in edX courses. Unfortunately this is also an access issue for those students living in countries that block such services. edX could avoid this constraint by looking to other services as a secondary point of access instead of relying on only one.

Conclusion

Overall, the edX platform fares well in respect to its ability to facilitate online best practices for professional education and graduate studies (Bates, 2015) when its existing and planned functionality was assessed against the recommendations of the 7 Principles (Chickering & Ehrmann, 1996).

EdX is a tool, and like any, can be used skillfully by some and poorly by others. That said, edX does provide a solid list of features and resources that, when used according to best practice, advance the seven principles and have positive impact on student learning. However, for a course developed on edX, it needs to be a collaborative process where all stakeholders uphold professional standards for learning. This requires participating schools and partners to develop and put forward courses that utilizes all the available affordances, students participating in a manner that correlates with the level of education being sought, and the platform provider continuing to produce a product that is aligned with professional and pedagogical excellence.

References

- Bates, M. A. (2015, 03 17). *Annotated Bibliography: Best Practices of Professional Education and Graduate Studies Across Blended, Online and MOOC Environments*. Retrieved from MET Portfolio: <http://www.metportfolio.markbates.ca/wp-content/uploads/2015/03/Annotated-Bibliography-Best-Practice-of-Professional-Education-and-Graduate-Studies-Mark-Bates.pdf>
- Berkeley University of California. (2015). *The Science of Happiness*. Retrieved from edx: <https://www.edx.org/course/science-happiness-uc-berkeleyx-gg101x>
- Cattura. (2014). *Cattura Video*. Retrieved from catturavideo.com: <https://catturavideo.com/>
- Chickering, A. W., & Ehrmann, S. C. (1996). Implementing the seven principles: Technology as lever. *AAHE bulletin*, 49, 3-6.
- Claros, I., Garmendia, A., Echeverria, L., & Cobos, R. (2014). Towards a collaborative pedagogical model in MOOCs. *Paper presented at the 905-911*.
doi:10.1109/EDUCON.2014.6826204
- Cornell University. (2015). *Networks, Crowds and Markets*. Retrieved from edx: <https://www.edx.org/course/networks-crowds-markets-cornellx-info2040x>
- EdX. (2015a). *About Us*. Retrieved from edX: <https://www.edx.org/about-us>
- EdX. (2015b). *.org FAQ*. Retrieved from EdX: <https://www.edx.org/about/org-faq>
- EdX. (2015c). *Univesity Advisory Board*. Retrieved from EdX: <https://www.edx.org/about/university-advisory-board>
- EdX. (2015d). *Board of Directors*. Retrieved from EdX: <https://www.edx.org/board-directors>
- edx. (2015e). *Including Google Drive files or a Google calendar*. Retrieved from OPENedX: <https://open.edx.org/features/including-google-drive-files-or-google-calendar>

edx. (2015f). *Course prerequisites and entrance exams*. Retrieved from OpenedX:

<https://open.edx.org/features/course-prerequisites-and-entrance-exams>

edx. (2015g). *Learner Profiles*. Retrieved from OpenedX: <https://open.edx.org/features/learner-profiles>

edx. (2015h). *Cohort specific content*. Retrieved from OpenedX:

<https://open.edx.org/features/cohort-specific-content>

edx. (2015h). *Cohort specific discussion experiences*. Retrieved from OpenedX:

<https://open.edx.org/features/cohort-specific-discussion-experiences>

edx. (2015i). *Enhancements Course Discussions*. Retrieved from OpenedX:

<https://open.edx.org/features/enhancements-course-discussions>

edx. (2015j). *XBlocks*. Retrieved from OPENedX: <https://open.edx.org/xblocks>

edx. (2015k). *Per-video activity report*. Retrieved from OPENedX:

<https://open.edx.org/features/video-activity-report>

edx. (2015l). *Improved search and browse features*. Retrieved from OpenedX:

<https://open.edx.org/features/improved-search-and-browse-features>

edx. (2015m). *Facebook and Google account integration*. Retrieved from OPENedX:

<https://open.edx.org/features/facebook-and-google-account-integration>

edx. (2015n). *edx Terms of Service*. Retrieved from edx: <https://www.edx.org/edx-terms-service>

edx. (2015o). *Guidelines for Creating Accessible Content*. Retrieved from Building and Running

an edX Course: http://edx.readthedocs.org/projects/edx-partner-course-staff/en/latest/getting_started/accessibility.html

- edX. (2015p). *Revise instructor dashboard for Professional Education*. Retrieved from OpenedX: <https://open.edX.org/features/revise-instructor-dashboard-professional-education>
- edX. (2015q). *edX: StudioX Creating a Course with Studio*. Retrieved from edX: <https://courses.edx.org/courses/course-v1:edX+StudioX+2015/info>
- edX. (2015q). *LinkedIn integration and certificate sharing*. Retrieved from OPENedX: <https://open.edX.org/features/linkedin-integration-and-certificate-sharing>
- edX. (2015r). *Student performance on graded problems in edX Insights*. Retrieved from OPENedX: <https://open.edx.org/features/student-performance-graded-problems-edx-insights-0>
- edX. (2015s). *Performance on ungraded problems in edX Insights*. Retrieved from OPENedX: <https://open.edX.org/features/performance-ungraded-problems-edX-insights>
- edx. (2015u). *DemoX*. Retrieved from edX: <https://courses.edx.org/courses/edX/DemoX.1/2014/info>
- edX. (2015v). *EDX101*. Retrieved from edX: <https://courses.edx.org/courses/edX/edX101/2014/info>
- edx. (2015v). *Feature Roadmap - All*. Retrieved from OPENedX: <https://open.edx.org/features-roadmap/all>
- edX. (2015w). *Feature Roadmap - Deprecated*. Retrieved from OPENedX: <https://open.edx.org/features-roadmap/deprecated>
- edX. (2015y). *Privacy Policy*. Retrieved from edX: <https://www.edx.org/edx-privacy-policy>
- edXw. (2015). *edX Guide for Students*. Retrieved from edx.readthedocs.org: <http://edx.readthedocs.org/projects/edx-guide-for-students/en/latest/>

Google.com. (n.d.). *Course Builder*. Retrieved from code.google.com:

<https://code.google.com/p/course-builder/>

Harvard University. (2015). *Play Video: Introduction to Computer Science*. Retrieved from edx:

<https://www.edx.org/course/introduction-computer-science-harvardx-cs50x>

IMS Global. (2015). *Learning Tools Interoperability*. Retrieved from IMS Global Learning

Consortium: <http://www.imsglobal.org/toolsinteroperability2.cfm>

IMS Global. (2015b). *Catalog*. Retrieved from IMS Global Learning Consortium:

<http://developers.imsglobal.org/catalog.html>

Kolowich, S. (2013, 02 21). *How edX Plans to Earn, and Share, Revenue From Its Free Online*

Courses. Retrieved from The Chronicle of Higher Education:

<http://chronicle.com/article/How-EdX-Plans-to-Earn-and/137433/>

Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013, 07 13). MOOCs: A

Systematic Study of the Published Literature 2008-2012. *The International Review of Research in Open and Distance Learning*, 14(3), 202-220.

McGee, P., & Reis, A. (2012). BLENDED COURSE DESIGN: A SYNTHESIS OF BEST

PRACTICES. *Journal of Asynchronous Learning Networks*, 16(4), 7-22. Retrieved from <http://eric.ed.gov/?id=EJ982678>

MIT News Office. (2012, 05 02). *MIT and Harvard announce edX*. Retrieved from MIT News:

<http://newsoffice.mit.edu/2012/mit-harvard-edx-announcement-050212>

Office Hours. (n.d.). *Office Hours*. Retrieved from officehours.co: <https://www.officehours.co/>

SchoolChapters, Inc. (2014). *About HMH Portfolio*. Retrieved from Schoolchapters.com:

<https://www.schoolchapters.com/about-hmh-portfolio/>

Tonsing-Meyer, J. (2013). AN EXAMINATION OF ONLINE INSTRUCTIONAL PRACTICES
BASED ON THE LEARNING SYTTLES OF GRADUATE EDCUATION STUDENTS.

Quarterly Review of Distance Education, 14(3), 141-149.

Welsh, D. H., & Dragusin, M. (2013). The New Generation of Massive Open Online Course

(MOOCS) and Entrepreneurship Education. *Small Business Instittue Jouranl, 9(1), 51-56.*

Appendix



Programming in Scratch

See how easy learning computer science can be. Use Scratch to create games, animations, stories and more.



Starts May 5, 2015 - Self-Paced

You Are Enrolled

About this course

"Although many of the programs designed to teach kids to code are very simplistic, many of them, like Scratch, are suitable for all ages. It doesn't matter how old you are...Get started with the basics of programming!" -Lifehacker

Want to learn computer programming, but unsure where to begin? This is the course for you! Scratch

[See more](#)

What you'll learn

- How to create amazing games, animated images and songs in the Scratch Programming language, one of the friendliest programming languages ever created
- The skill of solving interesting problems and making cool things with the help of a computer

Meet the instructor



Level:	Introductory
Length:	6 weeks
Effort:	6 hours/week
Subject:	Computer Science
Institution:	HarveyMuddX
Languages:	English
Video Transcripts:	English
Price:	FREE Add a Verified Certificate for \$50

Share this course with a friend







Prerequisites

Figure 1- Course Page

Weekly Student Engagement

How many students are interacting with my course?

Metric	Count
Active Students	642
Watched a Video	441
Tried a Problem	590

The chart shows a significant peak in engagement around late April/early May, followed by a steady decline. A vertical line is drawn at 5/26, indicating the current date of the report.

Figure 2 - edX Insights Video Analytics

Appendix



Figure 3- Weekly Student Engagement as viewed from edX Insights



Figure 4- Correct vs Incorrect Answers as viewed from edX Insights

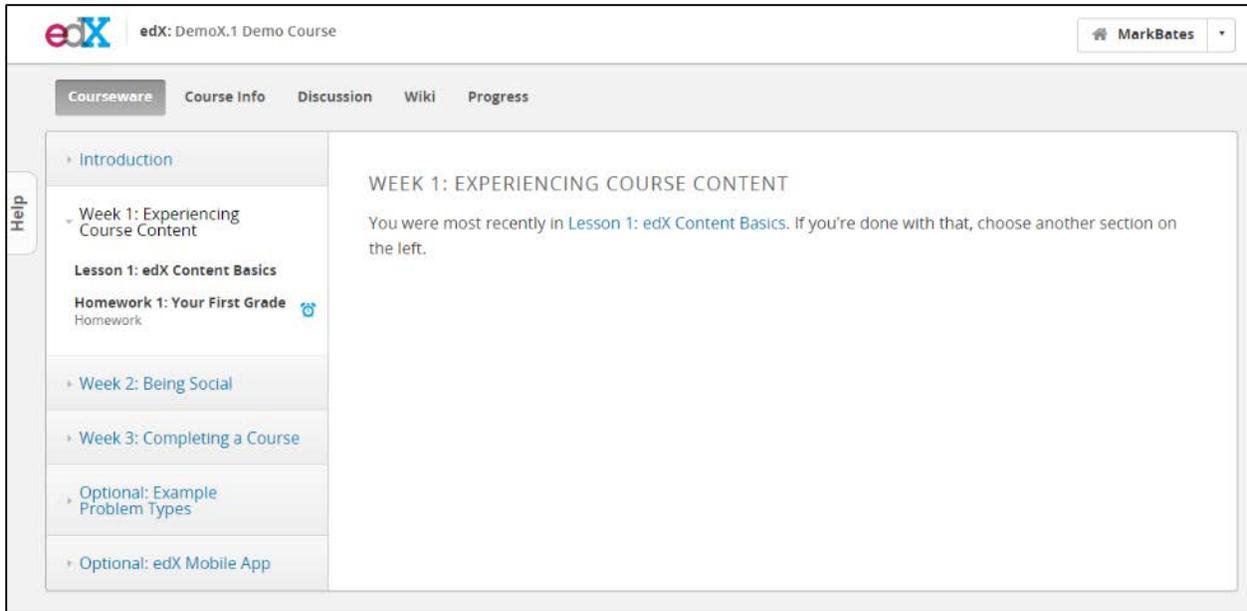


Figure 5- Student GUI of Course Site

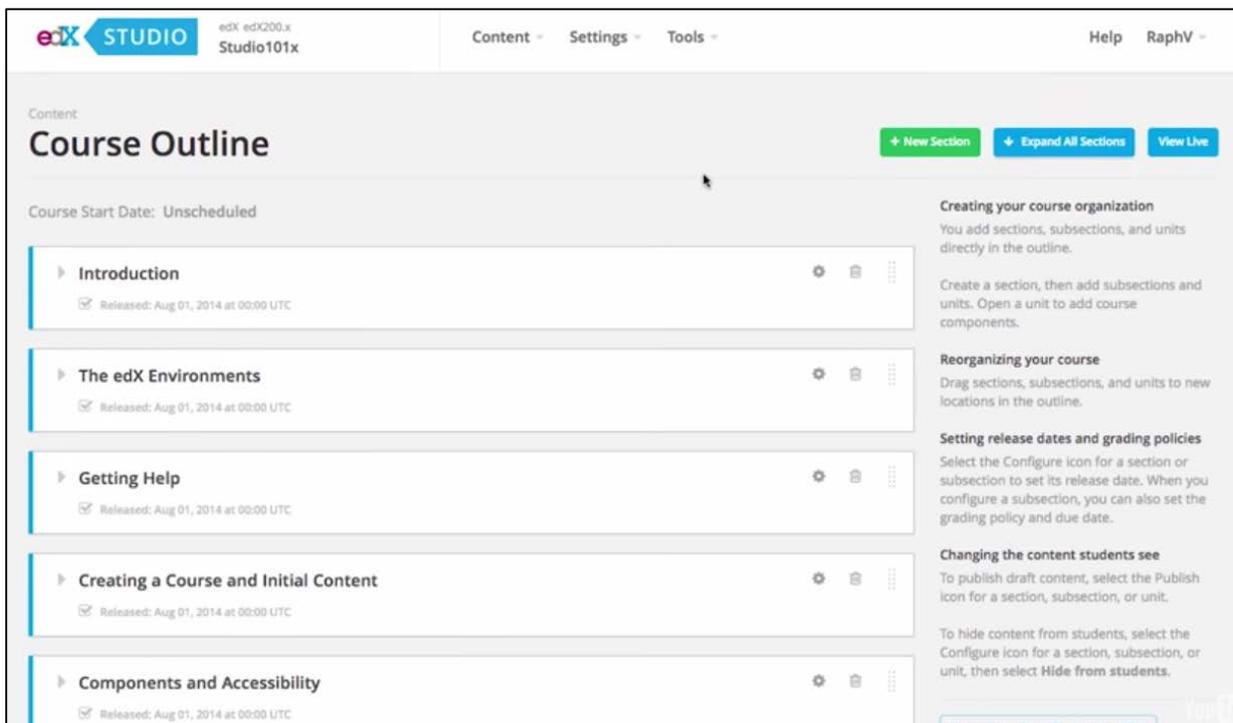


Figure 6- Course Outline in edX Studio

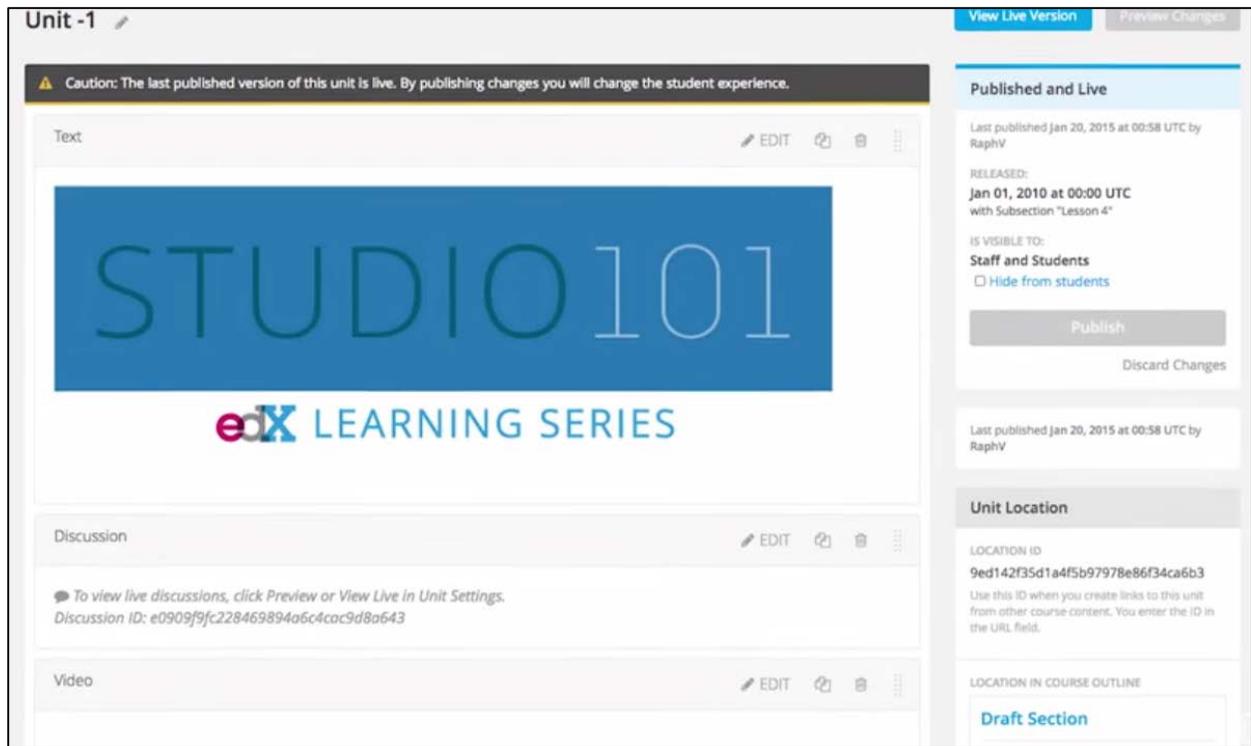


Figure 7- Course Home as viewed in edX Studio