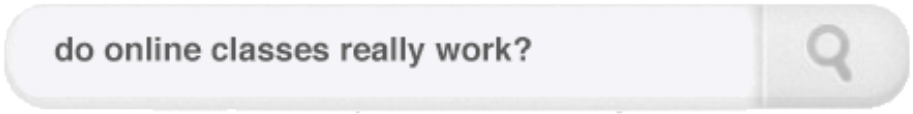

SUPPLEMENTING EDUCATION WITH TECHNOLOGY

DEREK BENEDICT

SUSTAINABLE SYSTEMS
AT PARSONS
THE NEW SCHOOL

THE NEW SCHOOL PARSONS

Mission Statement

Education is a fundamental need for the development of any and all societies. Many children and students cannot afford or do not have access to an adequate education, and at a time in which technology is such a prevalent and powerful tool, it is important that we harness the potential of computers and the Internet to improve the education systems that need help. This paper outlines why better education is essential, and it proposes a solution, which is an online video-hosting website, that is meant to act as a supplementary resource to struggling students.

Executive Summary

Education is a fundamental need for the development of any and all societies. For the many children and students cannot afford or do not have access to an adequate education, this paper proposes a website that harness the power of the modern technology to improve learning, in any scenario, for kids who lack access or funds for a decent education to students who are looking to get catch up in their college courses. The Internet is a powerful tool that has made the world a more accessible place, and American education systems have done a poor job of using this power to enhance the learning experience in its schools. This website makes accessible a range of educational videos that can be used for all levels of learning. For those who struggle to read, there are courses geared toward helping children learn reading skills. It hosts college level math and science courses as well as entry level programming classes. The site is intended to be a home for students who want to pick up and learn something new or to continue progressing a skill that is already in development.

The website's convenient tools make it easy to take quick notes and stay organized. A weekly to-do list enables the student to keep up with the workload and plan ahead for assignments and projects. Some courses are very structured with weekly assignments and discussions, and other courses are more laid back without any commitment at all. The site is primarily intended to be used as a supplementary resources for students to helps them along in the classes at school, by offering a fresh perspective and a new voice, but it is open to be used by a student for any type of learning. University's can offer prerequisite courses as an affordable option to incoming students, companies can provide structured courses for potential employees, and high schools can offer additional materials for struggling students to keep up with their classes. Geared toward the students who can't afford the schooling that they ned, this website is a tool that makes educational resources accessible and affordable in an online format for the kids who haven't had the opportunity they deserve.

The Importance of Accessible Education

The Internet is a powerful tool that has made the world a more accessible place, and American education systems have done a poor job of using this power to enhance the learning experience in its schools. Replacing teachers with technology has been the traditional approach to integrating technology into the classroom, but this has proven to be ineffective.[1] At the college and high school levels, online classes are often alternatives to the traditional classroom setting, and in these cases the teachers' roles are taken over by the computer. However, it has been determined that technology is best used as a supplemental tool in the classroom. It is common to consider that a class will either be all in the classroom or all online. When online assignments are incorporated into the traditional school setting, they are often separated completely from the course's style, meaning that the teacher takes on the entire role or none of the role of the instruction. Stanford's CREDO facility studied the learning differences between traditional charter schools and online charter schools, and according to the students' academic growth throughout the year, online charter students showed much weaker growth.[2] These all-or-nothing approaches are not effective.

Aside from American tuition rates, education systems everywhere have their own struggles. Children in underdeveloped countries largely do not have access to even the most basic education needed to advance their cultures. "Money isn't everything, but it is a key foundation for a successful education system",[3] and a lack of funding to train teachers, build classrooms and acquire learning materials are the main reasons these countries are under-educated. Improving basic education in developing countries allows their citizens to be healthier and grow economically. One-hundred seventy-one million people could be lifted from poverty if they were taught basic reading skills.[4]

There is also a place for technology to be better integrated in low-income schools around the United States. Stanford's Scope researchers found that there are three productive approaches in introducing technology into classrooms: promote it in a way for interactive learning; use technology to explore and create rather than to "drill and kill"; and incorporate the right blend of teachers and technology.[5] Students need to be able to translate back and forth between real and virtual experiences in order to engage their minds in full capacity. "One of the benefits of well-designed interactive programs is that

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[1] Alliance for Excellent Education. "Technology Can Close Achievement Gaps, Improve Learning." Stanford Graduate School of Education. September 10, 2014.

[2] Woodworth, James L., Margaret E. Raymond, Kurt Chirbas, Maribel Gonzalez, Yohannes Negassi, Will Snow, and Christine Van Donge. Online Charter School Study 2015. Center for Research on Education Outcomes: Stanford University. 2015.

[3] Write to Learn. "10 Barriers to Education around the World." Global Citizen. June 2, 2014.

[4] "The Benefits of Education | Global Partnership for Education." The Benefits of Education | Global Partnership for Education.

[5] Darling-Hammond, Linda, Molly B. Zielezinski, and Shelley Goldman. Using Technology to Support At-Risk Students' Learning. Scope: Stanford Center for Opportunity Policy in Education. September 2104.

they can allow students to see and explore concepts from different angles," [6] says Scope, which is especially important to low-income students who don't have the opportunities to stray outside of their communities. These programs help to bridge the achievement gap between low- and middle-income students.

Online education often comes with a stigma. This stems from the usual method of online courses that tend to replace the teacher's role. Small class sizes are seen as an advantage in the college classroom because the interaction between teacher and students is highly valued, which is why universities will display their student-to-faculty ration as part of their marketing strategies. Online courses are seen as a step away from this. Student and teacher interaction is nonexistent online because online courses often distance the students from their professors.

MIT News set out to disprove this stigma with their MOOCs - or Massive Open Online Courses. MITx offered a Mechanic Review physics course online and they studied the test results of their students. They found that "the amount learned is somewhat greater than in the traditional lecture-based course," regardless of the student's level of education. They developed a way to analyze test questions and homework assignments to measure their students' achievements, and their conclusion was this. "'All cohorts learn equally,' whether compared on the basis of level of education, degree of preparation in math and physics, or other measures." [7] They have found consistent results. They key, they say, is constructive engagement, whether in the classroom or online.

The basis of success of online courses seems to lie within the amount of engagement that a student has with its teachers and its classmates. Interactive programs are useful tools in offering outside perspectives on topics that are otherwise not achievable in classrooms. Engaging with other classmates does not have to be limited to a physical classroom setting, but this lack of peer-to-peer interaction is often the reason why many online courses are not helpful.

Competing Solutions

There are websites that offer wide ranges of educational material, mostly in the form of online video classes, and they are successful in their own right, but they do not all inhabit an immersive experience that simulates the engagement traditional schooling.

Skillshare [8] is a good website for learning new skills. A lot of the classes have turned toward the artistic side though, so they aren't as applicable toward higher education, and while they host many courses that cover introductory topics of these skills, many of them cover the same skills. They offer courses in a variety of categories, ranging from photography basics, social media marketing, brewing coffee and type-facing. The courses don't go into much depth, so it can't be expected to become an expert through Skillshare

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[6] Darling-Hammond, Linda, Molly B. Zielezinski, and Shelley Goldman. Using Technology to Support At-Risk Students' Learning. Scope: Stanford Center for Opportunity Policy in Education. September 2104.

[7] Chandler, David L. "Study: Online Classes Really Do Work." MIT News. September 24, 2014.

[8] Skillshare, Inc.

alone. They offer some free classes and their premium membership price is $96 per year. Their videos are divided in separate modules, which is a good organizational feature. Classes are taught by anyone from freelance artists to industry professionals. Courses typical feature class project communities in which students enrolled in the course can bounce ideas off of each other and share their work. Skillshare is a great website for finding interests and having fun in exploring something new.

Lynda [9] is a LinkedIn company that hosts videos much in the way that Skillshare does. Unlike Skillshare, Lynda has courses that are focused on career paths, so they have playlists organized specially for those looking to develop their skills in depth in a field, and they supply certificates to help student find careers through LinkedIn. Lynda's learning paths are taught by various teachers, and these paths require time commitments of upwards of thirty hours without really know if the content will be useful. The price for Lynda's premium membership with the ability to download project files is $350 annually.

TED Talks [10] are a great way to explore the most polarizing events happening around the world right now. They are inspiring, frightening, saddening and motivating. TED Talks serve mostly as an attention-grabbing introduction into a topic. They are well-presented informational lectures more than they are instructional courses. All TED Talks are free.

EdX [11] is a website that hosts university MOOC videos, namely from schools like Harvard, MIT, and Caltech. These are college level courses in science, medicine, music, business and more, and they are taught with assignments to be completed throughout the courses.

iTunesU hosts various classes in video that are format that are mostly in the humanities subjects. The videos can be downloaded and stored along with lecture notes directly to iTunes. The videos are well-composed and the courses are mostly introductory level.

Solution Proposal

The solution for the project is a website proposal. Rather than coding an website, the proposal will be a series of graphic designs showing how the proposed website would function.The website would include the content in the following paragraphs:

It hosts a variety of instructional videos and online courses. From the MOOCs as in edX's catalog to the basic skills that Skillshare offers, this website will essentially be a culmination of the effective aspects of the aforementioned existing solutions. Videos will be in course form, meaning that each subject will be divided into its own chapters of videos, much like a textbooks is broken into sections and chapters. Courses will be taught by partnering teachers rather than each professor teach its own course, much like a textbook that is written by more than one author. Teachers will collaborate to provide course notes and contents and to create assignments for the students' access. An assignment will accompany each video, and while the student will not have to complete the assignment

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[9] Lynda.com: Learn a New Skill Online, on Your Time.

[10] TED: Ideas worth Spreading.

[11] EdX.

before moving on the next section, a deadline will be placed for each assignment, and if the student fails to meet a certain number of assignment deadlines then she will not be able to pass the course. The student will be able to re-watch any lesson once it has been completed. At the end of the course, the student will have accumulated a portfolio of all of their assignments, and a certificate of completion will be offered to the students who have passed the course. There is no penalty to failing a course and the student will be able to retake a course as many times as desired.

The teachers who have organized the curriculum will provide the course materials necessary to complete the class. These materials consist of course notes, slideshows and presentations, homework assignments, project assignments, and readings. A transcript will record all of the words that are spoken throughout the video. The transcript will be an efficient tool for copying and pasting notes. The website will feature high school level courses and general instructional videos as well, ranging from pattering making to creative writing exercises to daily productivity tips and more.

The website will have separate tabs for university courses, high school courses, and instructional courses. Each tab will have categories defined by the school subject of the courses (i.e, biology, history, cooking, etc.). Classes can be filtered by subject, university, instructor, and grade level . Each member of the site will have an account, and this account hosts a list of currently enrolled courses and a to-do list of current assignments.

The site's videos will be watched on the site's custom video player which will feature a screen capturing ability for notes, the ability to place a marker at any important moment in the video, the ability to tag any notes taken in the notebook with a specific time at which that student would like the note to refer back to, all along with the standard functions of a video player. The keys will be coded with shortcuts (spacebar to pause, arrow keys to jump backward and forward in time), and the shortcuts will be posted on a tutorial page on the site for guiding information for students discover how the site works. All notes will be kept in a note box underneath the player. The course's transcript will appear beneath this box. In the note box, the student can store text notes and screenshots and links and anything that the student wants to gather from the video in any form to keep as a note.

Sustainability and Effects

This website is designed primarily as a tool to supplement the in-class work of students enrolled in high school and college courses. This tool is not necessarily meant to replace any material, but that capability is there if it needs to be. This tool is for anyone who wants to catch up or get ahead in school, for anyone who is struggles and needs a new viewpoint on a subject, and for anyone who wants to learn. It is sustainable in the fact that nothing physical is being created to run the website. It is built on the foundation of other resources that already exist, and it merely rearranges them into a highly accessible format. Better education makes society more resilient. Multiple studies show the social benefits of education, and that, especially in underdeveloped countries, educating children leads to less poverty, better health, saved lives, and it increases the general standard of life. It also

makes the world more equal, in gender and in poverty.[12] [13] A user needs a computer, internet access, and electricity in order to use this tool. If the solution fails, human energy has been wasted and nothing else.

A burden and a relief of instructional videos online is that there is no commitment. There is no pressure. This is inviting to students, so it is a positive way to attract students to watch these video, but a lack of commitment means that many students will start the video or the course but they will not finish it. Coursework typically gets more difficult as the course moves along, so it's important to reward student in some way, and this is why the there is an overall Pass/Fail grading scale for the courses. They need a reason to keep coming back. Offering only the concept of learning will not be enough motivation to keep students involved all the way until the end of the course.

This project stems from the need for better online education. While this may not solve the world's education problems, it will most certainly not be unsustainable. Hopefully, it will spark a realization that online education is a resource that is to be taken seriously. While is not a replacement solution built to stand alone, it will improve the systems of education in place today. Struggling schools in low-income areas will be able to use this tool to supplement education for students, especially to help at-risk students. Whether it be more fun, more accessible, or just more school, it will certainly offer a different perspective outside of the classroom, because sometimes all that is needed is a new view on what is mundane. It will allow students to take a step away from the mandatory work and the pressures of schools and allow students to explore learning on their own.

How the Proposal Will Succeed

The way that this website is marketed to students may be the product's driving force. On a personal note, I've been using sites like YouTube and Skillshare and TED Talks and Khan Academy for years, which are all great learning resources, but only after a week of research was I able to find a website like edX, which features real classes from reputable universities. It is a terrific resource; its largest problem, though, is that not enough students know about it. Kids will spend hours a day on site like YouTube [14] watching videos with no educational purpose, only to be entertained. Instructional videos need to be marketed in entertaining ways in order to grab the attention of these kids. The reasons TED Talks are so widely recognized is that they are fascinating videos. Students will not spend the time, much less the money, watching these videos unless they really *want* to. Presentation and organization are the keys to educational success in a digital age in which students have more resources than they can handle.

An online resource like this will work best for subjects that have cut-and-dry, step-by-step processes that lead to a solution. Math classes ranging from basic math to calculus,

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[12] "The Benefits of Education | Global Partnership for Education." The Benefits of Education | Global Partnership for Education.

[13] Write to Learn. "10 Barriers to Education around the World." Global Citizen. June 2, 2014.

[14] YouTube.

physics classes, and statistics classes are good examples. The playback ability that videos offer is the primary reason for their effectiveness in the classroom. Any words or notes that were missed in the classroom cannot be replayed or slowed down to the student't pace, so this is where the main advantages of online courses come into play. Many primary schools don't really offer any classes in software like Photoshop or coding or any sort of design, so students must rely on what they can find on the Internet to learn about these things, based upon their own out-of-class interests. It works to watch a tutorial while you're working on something and following the tutorial, in which case the instructor is showing you how to do it on a piece that he's working on, and the student applies the same steps to the piece that she's working on. Again, these videos can be replayed as many times as needed for the student to gain full understand of a section in class.

Online courses are not a definition of converting everything that is involved with the course into an online state. It merely should be the conversion of moving the *in-class physical experience* and condensing it into the physical space of the on-screen computer experience. There exist those teachers who read and discuss what they've prepared from a slideshow, and that isn't what is needed from online education. Truthfully, anything that has been prepared ahead of time can be translated into a a digital state. Slideshows are already digital, so all you need to do is access the files. The organic discussion that arises during class time is where the value is held in the classroom setting. A lecture can be converted into a video and a transcript for digital use. Anything that is written on the board during classes is largely pre-prepared material, and anything spontaneous can be recorded and converted for digital use, probably in images or within the lecture video or place into the lecture transcript, or all three. Online tools allow such powerful tools to be put to use in the classroom, and it's time for these capabilities to be harnessed for better education around the world.

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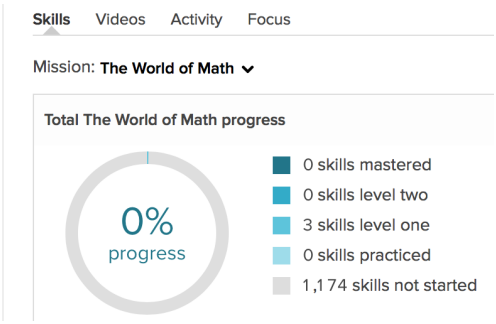
Appendix

Solution Images for Reference



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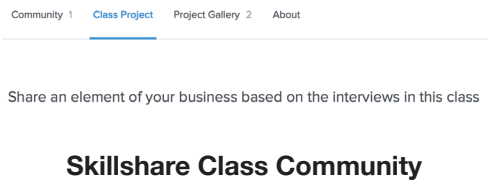
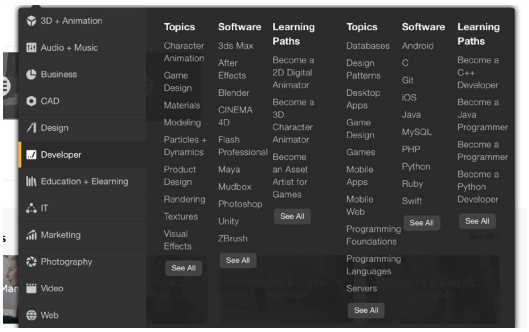


Skillshare Class Community

Skillshare Video Player

TED Video Player



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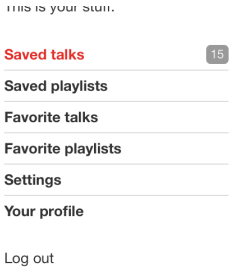

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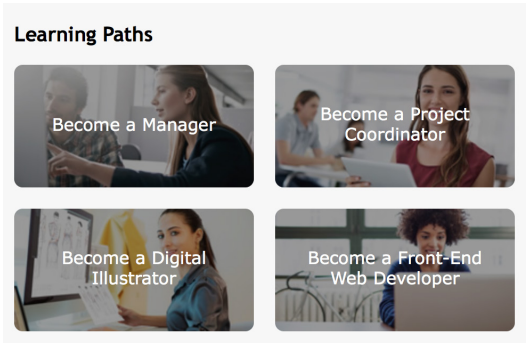

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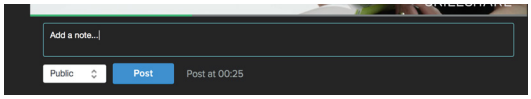

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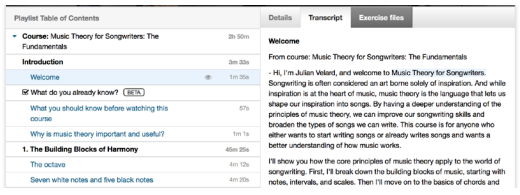
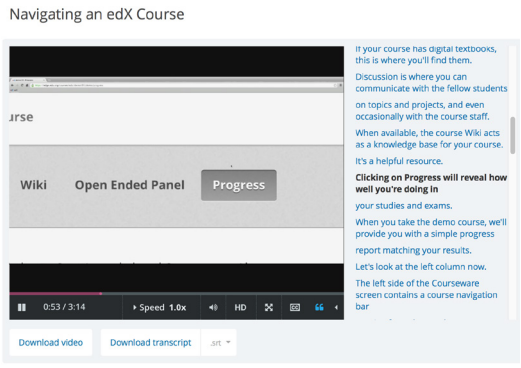
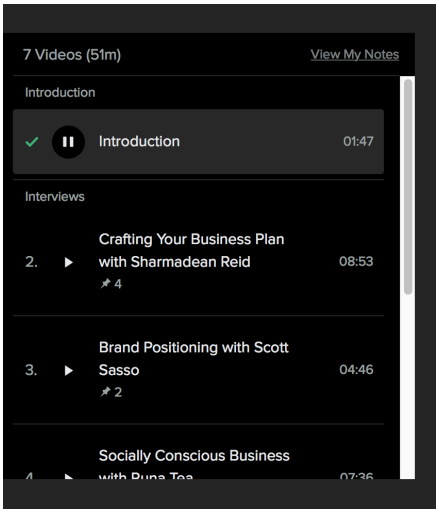


Lynda Transcript & Setup



edX Video & Transcript

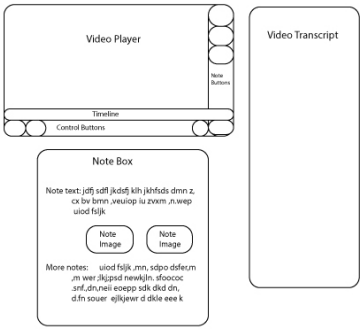


Skillshare Menu Setup

Appendix

Sketches & Outlines & Designs

Proposal Sketch



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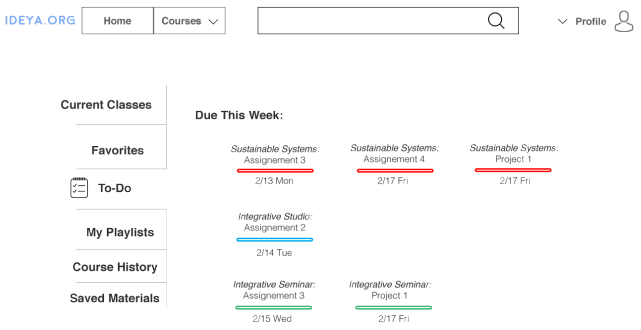
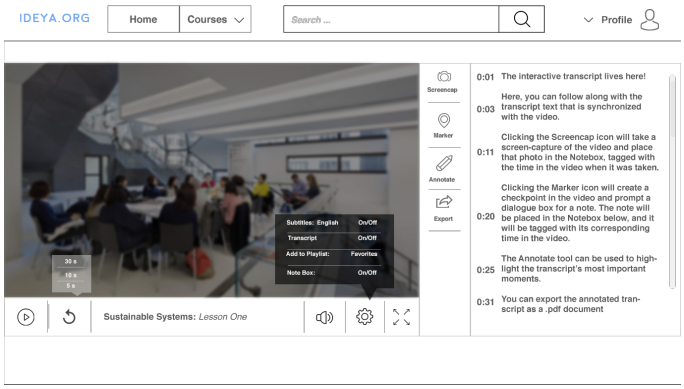


PR Online Ad

Video Player & Tools



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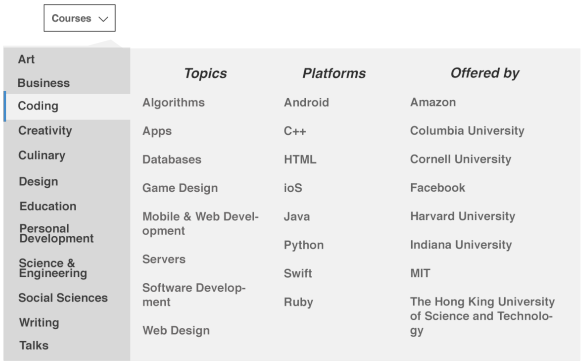
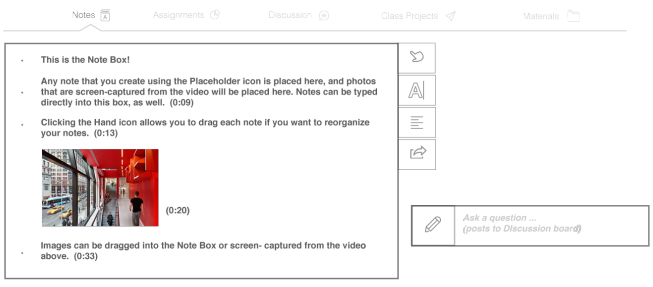


Note Box & Tools



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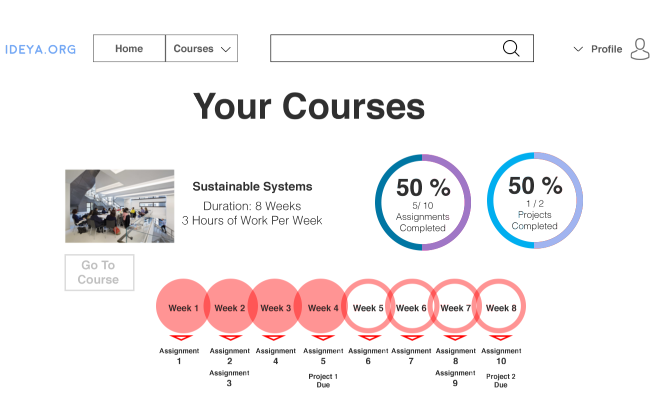

Self Assessment

Starting off, I wish I would have known about more of the resources that are available for online learning. I held an interest for this because I relied on finding tutorials online when I was in high school since my school did not offer classes in some of the things I was interested in, which were mainly digital media courses in Photoshop, film editing, music production, computer programming, and photography. Whether this is due to a lack of instructors who are versed in these areas, or whether it was a lack of money and access to the software and resources, I felt like I was at a loss when I was unable to learn these things in school. I looked online for courses, because they were often free or they were much cheaper than paying thousands of dollars taking a class or camp at an institution, but I was always disappointed in the brief and unorganized tutorials I found online, and I thought they could use improvement.

I used YouTube and Skillshare mostly and, even after a few years of searching for all the tutorials that I could come across on the web, I wasn't able to find many good resources. After a week or so of researching for this project, aiming to find an answer as to why college education continues to be so expensive and why online courses aren't used as a more affordable option (or why they aren't used well, at least), I found websites like edX and Coursera and Udacity, all of which offer courses that are hosted by universities (like MIT, Harvard) and companies (like Google, Facebook). Up until I found these sites, my goal was to create a website that offered educational classes from reputable sources for free or at a cost cheaper than that of paying to fully enroll in the university and use its facilities. Finding these sites after committing to this project led me into a conflict of whether I would really be able to create something unique and improve sustainability.

In creating the website that I did, I admittedly focused too much on the design and functionality of the website's tools and I don't think I emphasized enough the sustainable features of it. Not that it doesn't improve sustainability, because I think it does when it is used in certain ways, such as a resource for people who can't afford to to take classes in these subjects, that is, if they have access to a computer. It creates an opportunity for people to learn things they otherwise wouldn't be able to.

I do like the idea of having libraries as public spaces where students can access the website without needing computers and Internet and software of their own. This

would be especially helpful in schools in underdeveloped countries who can't afford to teach certain classes, or can’t afford to teach at all. Creating a program that opens libraries in accessible areas for these schools would be a separate project in itself, but it would be a very good supplement to this website project and I think the two would work very well and sustainably together. I like the site I created; I think it is an improvement in the way we typically approach online education today. In order for it to be truly useful, though, I think it needs to be paired with programs to reach areas of the world that lack access to proper education. By itself, the website is a good platform to improve sustainability through education.