A Menu for Learning

Saint Joseph's University
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INTRODUCTION

Too Much to Swallow or Leaving you Wanting More- Sous Chefs Indulge or Nibble

On the hunt for a savory culinary treat, we sought out to find engaging instruction from some of the most brilliant minds in academia who may be willing to share their favorite recipes to interested sous chefs everywhere. Hoping for a creative meal both fascinating and filling, we knew the top chefs from Harvard University would not disappoint with their passion for sharing knowledge combined with their spirit of innovation. On the menu was an edX massive open online course, or MOOC, called *Science & Cooking: From Haute Cuisine to Soft Matter Science (Physics) hosted by brainy physicists serving up a buffet of formulas and strudels. We also took tips from Harvard alumni, pastry chef, and owner of Flour Bakery, Joanne Chang, in her* YouTube Video *The Science of Sugar (also sponsored by Harvard University). By selecting two different platforms with similar themes and produced by the same university, we endeavored to review their aesthetics and assess which program's recipe for instruction was most appealing and effective.*

APPETIZER

MOOC

A Wholesome and Substantial Bread Basket for the Table

EdX is an online repository for MOOCs and content shared by some of the most prestigious universities. Accessing a MOOC from this platform is somewhat like walking into your favorite restaurant and finding there is a wait. Registration and a back and forth user verification process is required the first time you want to access material. Once through, you are privy to all online content hosted in edX. Science & Cooking is served up like a wine list with breaks of content, the first being an introduction screen with tips and best-practices. This particular wine list is overwhelming, with over ten in-depth recommendations listed before even getting started. Recommendations included items like sharing your favorite recipe in an online discussion forum, so there was a social component wonderful for learners who are supported by concrete experience or reflective observation.

The appetizer menu had several choices such as a welcome from the instructors, a syllabus and a pre-course survey. This survey filled up many guests at the table before the entree was served, with over 30 questions aimed at identifying the demographics of the learner as well as why there was interest in the subject matter. The final serving of our starter course was two short videos on the history of cooking, a delicious treat for our Abstract Conceptualizers at the table, while causing Active Experimenters to feel a sense of food coma (Kolb & Kolb, 2018).

YouTube Video

A Bite-Sized Amuse-Bouche with a Flavor for Every Taste at the Table

YouTube is a favorite at many local restaurants as an online video platform and repository. As opposed to a formal education certification process, YouTube learners order for the fast food experience as one can log in very quickly with no credentialing needed. To locate this appetizer, learners at the table searched YouTube for science and cooking and were quickly delivered to Joanne Chang's T*he Science of Sugar* video, along with several other interesting recommendations. If the Science of Cooking had an extensive wine list, this video had no drink menu at all. The set up was fast in the video, with a quick introduction and a hand off to Joanne Chang, an applied mathematics alumni from Harvard. Joanne was able to quickly connect with an audience of learners representing different styles in the inventory; she used past experience, story-telling, a live demonstration, and analyzing concepts in her instructional delivery within the first few minutes of this starter course. Joanne was able to deliver a careful balance of all Kolb's learning styles, emphasizing Concrete Experience with her relatable and appetizing presentation style (Kolb & Kolb, 2018).

HARVARD UNIVERSITY

ENTREE

MOOC

A massive open online course heavy with scientific formulas and detailed organization of chunked learning

The MOOC course, *Science and Cooking*, built upon itself, layer by layer, with a course introduction module and a final review module to set the table and then review the experience. There were a total of six modules covering topics on elasticity, viscosity, polymers, emulsions, foams, manipulating phase behavior, enzymes, and baking.

The MOOC catered to two different learning styles on the Kolb inventory. The infrastructure of the course encouraged Active Experimentation with labs and homework and the overall content is dense with Abstract Conceptualization due to the logical analysis and systematic approaches (Kolb & Kolb, 2018). Each module began with an overview sharing what to expect and introducing the instructors. The meat of each module was broken down in bites ranging from 13 to 19 different sections where all learning styles were addressed. There was text to read, problems to answer, and videos to listen to and watch. The text was written in short paragraphs and serves to either introduce a topic or share specific examples to guide the learner through the scientific principle. The practice problems serve as a knowledge check to ensure the learner did read or watch the entire previous content or that the learner was able to apply the information learned to a different scenario. The lecture videos demonstrated practical applications of the scientific principles and showcased examples of the results from simple cooking experiments. Once the content is covered, each module moves on to a lab where learners were expected to do their own experiments and homework to report back specific results to an anonymous responder. There was a high level of complexity to the content, lab, and homework section which challenges the instructors' stated intention of the course to bring science to non-science majors. Once all six modules are completed, the learner was expected to complete a final project where they explain, in scientific terms, an aspect of a recipe or culinary invention. The learner is asked to share their projects with their culinary classmates to encourage further learning and showcase an example of experiential learning.

The MOOC course was most closely aligned with Cognitivism with learning as a mental process where the instructors and infrastructure of the course was focused on helping the learner change their knowledge and behavior when working with food (Merriam & Bierema, 2014). In order to advance through the course or to gain the certificate, the learner had to demonstrate learned knowledge through labs, homework, and a final project.

YouTube Video

A lighter fair on-demand video sprinkled with scientific education and leaving a satisfied sensation of just-in-time learning

The YouTube video *The Science of Sugar is a one-hour educational video explaining and demonstrating how sugar reacts to different melting points. The instructor asks the live learner audience questions which she integrates the answers throughout her presentation maintaining a sense of connection with her live audience. The topics covered in the one-hour video included explanations and demonstrations of the various roles sugar plays when added to different desserts.*

The YouTube video catered primarily to the Kolb inventory learning style of Concrete Experience with the instructors focus on sharing specific experiences while relating back to the live learner audience with real-life practical examples of the complex scientific principles (Kolb & Kolb, 2018). The instructor demonstrated connecting with the live audience but there was no opportunity for the virtual learner to interact with the learning experience limiting the potential engagement. The content, while based in chemistry and physics, was accessible and easily palatable for a non-science major and for those who simply enjoy cooking.

The YouTube video session was most closely aligned with Social Cognitive theory where the instructor focused on modeling the techniques and demonstrated how the scientific principles come to life in the kitchen while engaging with a live audience (Merriam & Bierema, 2014). The social aspect is lost, however, for the virtual learner.

DESSERT

MOOC
A dense layer-cake with formula frosting

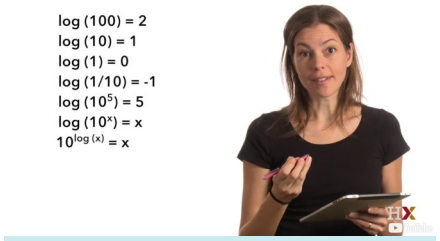
While we were full from all of our learning, we naturally saved room for dessert. The final module, listed as the review section, is available to students throughout the course and provided reference points for several topics. In addition, it provided a resource for students to practice the mathematical and scientific side of cooking with segments like Unit Conversion, Density, and Logarithms. This approach provided adult learners the ability to be self-directed, one of Knowles' four assumptions (Merriam & Bierema, 2014). The scientific formulas were in danger of leaving a bitter taste in the mouth of non-mathematical fanatics. Luckily, the review problems include quick videos to help solve some of the more difficult questions. These videos provided an opportunity for learners preferring Kolb's Concrete Experience to observe and review a case study of sorts (Merriam & Bierema, 2014). It also provided Kolb's Abstract Conceptualization learners the reference of guidelines, lecture, and film, that they prefer (Merriam & Bierema, 2014).

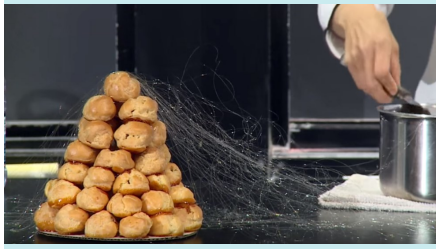
YouTube Video
Bite-sized Taste of Sweet Samplings

Joanne Chang's, *The Science of Sugar,* YouTube course ends with a couple of questions to the audience from the host, Michael Brenner, helping them to critically think about why flicking caramel on a croquembouche creates caramel strings. In general, the video stops without a summary or questions from the live audience. This closing may have occurred in the live class but was not included for the virtual learner. Joanne's dessert demonstration was fascinating, but her closing was not the cherry on top as we were left with mouths watering for more.

A DECADENT AFTER DINNER CORDIAL

However refined a learner's palate may be, Harvard University proved to have the right selections on the menu with both platforms of learning. Instructors offered up recipes within their courses that entice learners from all spectrums of Kolb's Learning Style Inventory. *Science and Cooking, the edX course, satisfied Active Conceptualizers and Experimenters with its dense technical filling. And Joanne Chang's The Science of Sugar YouTube video presented a lighter fare to the Observer or Concrete Experiential patron. Harvard University and their staff of qualified and intellectual professors and alumni have mastered the art of instruction catered to all learners.*





NUTRITION

PROS and CONS

MOOC

PROS

- Harvard Instructors
- Quizzes
- Able to save work and return/Self Paced
- Shows completion rate
- Can earn certificate
- Lab opportunities for practice
- Multi-pronged curriculum (visuals, facts, experiential)
- Encourages Active Experimentation with labs
- Demonstrates Abstract Conceptualization with logical approach to content
- Intentional mixed-media flow - content moves from text to example to demonstrate to assessment

CONS

- Highly technical
- Unable to see reactions of audience
- Requires many hours to complete
- Directed to a specific audience
- Collaboration space setup but did not appear very interactive
- Misses the mark with Concrete Experience by not relating to the audience as directly, leaving the sense of a disconnect between instructors and learners
- Overwhelming amount of pre-instruction

YouTube

PROS

- Brief
- Harvard Instructors
- Uses comparisons
- Uses humor
- Topic that can be incorporated into one's everyday lives
- Visual demonstrations
- Questions to audience
- Grounded in Concrete Experience through the instructors relation of experiences to

CONS

- Unable to see reactions of audience
- Unable to taste outcome
- No forum for hands-on practice
- Unable to collaborate with other learners
- Does not encourage Active Experimentation in format or by instruc-tion

Yelp Review

Each reviewing sous chef shares their personal opinion and ratings in the comments below.

Mooc Review

Amber Carlson-Hays

The stated intention of this MOOC by the developers was to bring science to non-science majors in an accessible way. While the course accomplishes the task of bringing the information, they miss the mark on bringing the science to life. The course has a chunked design where different learning styles are taken into account while also ensuring that there is a balance between text, interactive problems to answer, and videos. The social discussion board and homework elements are intended to be the opportunity for the learner to engage but I found myself feeling discouraged since the content felt beyond my understanding. It appeared that there were a few others on the discussion board who showed a higher degree of enthusiasm. Due to the speed at which the content was delivered and the few examples given, this course brings the science but has opportunity to make it more digestible. While the MOOC does encourage Active Experimentation (my learning style in the Kolb inventory) in its format, I did not feel compelled to engage due to the high level of complexity.

Mae Kramer

found the different types of delivery and media used throughout this course to be very appealing. Just when I was full from conceptual information, we moved into another format that got my mind digesting in a different way. I enjoyed the videos and some of the interactive components that I was able to participate in. I appreciated the ability to participate in Active Experimentation as that is my primary learning style. The course missed the mark on another preference of mine, concrete experience, as I am not a great cook and the formulas and concepts were too complex for me to draw from prior experience or knowledge.

Jessica Littlejohn

I thought the course was well thought out and fully developed. The consistent flow of explanation, video demonstration, and lab made it easy to know what to expect and provided options for various learning styles. However, this course required more than what they shared as basic high-school algebra. This highly technical physics and chemistry course was out of my comfort zone. I can appreciate the design of the course, but the level of the content was beyond me! This course seems like a good fit for a fact based, active converging learning style.

Jessica Peck

I enjoyed the interaction piece of this platform with the audible questions and quizzes following each module encouraging some Experimentation. However, it was rather early in that I started to realize that this MOOC was intended for a very specific audience well-versed in advanced chemistry and physics concepts which I am not. The language used throughout the instruction was beyond my scope and I soon lost interest. I did appreciate that a student can save their place, leave and return and that the progress is denoted by check marks signifying completion. I managed to walk away with a deeper knowledge of cooking a more perfect steak as well as a better understanding of elasticity and viscosity in our food so it was not all a loss.

YouTube Review:

Amber Carlson-Hays

While the video had a lack of structure, pre-learning, homework, and balance of learning style delivery methods (lack of reading), I found that I walked away from this learning experience feeling like I was able to absorb the content and apply it in real life. I appreciated the presenter's down-to-earth approach to teaching others as well as the multitude of examples shown to explain the science behind the cooking process. Looking back, I retained more detailed knowledge from this single 48-minute video than the chunked format of the text, problems, and mini-videos of the MOOC. Could this be because of the content itself or the method of delivery? Either way, this video was more palatable for this non-scientific cook. I would have liked it if the YouTube video had encouraged the live or virtual learner audience to try the experiments at home and make a Croquembouche sugar crown.

Mae Kramer

I appreciated the expertise and personality of the instructor, Joanne Chang, from the start of this course. She was highly informative, relatable and engaging to watch. As a learner that needs to participate in hands-on experimentation it was difficult for me to engage in the entirety of this video, at a little over 45 minutes long. While the instructor delivered to all types of learning style intentionally, I had trouble concentrating on the strictly video format after about 20 minutes. That said, the content itself was much more relatable and simplistic so I was able to use prior knowledge and experience to give my learning transfer a little trajectory.

Jessica Littlejohn

This course was full of energy and excitement. Unlike the MOOC course, I was able to relax and embrace the content and even learned something about sugar! The infusion of questions with the audience and demonstrations provided a nice balance of lecture and interaction which supported my reflective observation style. I wish one of the kinesthetic learners from the audience would have been invited on stage to help. I like a little bit of structure so this course lacked the opening and closing I prefer to help connect all the dots.

Jessica Peck

Joanne Chang brought a sense of humanity to her instruction. I felt as though I was sitting in the audience and was able to interact by answering questions along with the others. By incorporating humor and comparisons into many aspects of her teaching, I was engaged and able to keep up even when some concepts were not in my wheelhouse. I enjoyed watching the teaching come to life in real time and learned quite a bit about the purpose of sugar and how slight changes in its measurements can drastically affect a cooking plan. Speaking to the Concrete Experiential part of me, I was inspired to take a chance and put some of her ideas into motion on my own. To me, that is the goal of a successful teacher/learner relationship.

CREDIT TO THE CHEFS

Harvard. “Joanne Chang: The Science of Sugar.” YouTube, YouTube, 19 Mar. 2015, www.youtube.com/watch?v=DOabtB-P-lk.

“HarvardX: SPU27.2x Science & Cooking: From Haute Cuisine to Soft Matter Science (Physics).” HarvardX, courses.edx.org/courses/course-v1:HarvardX+SPU27.2x+1T2018/course/.

Kolb, D.A., Kolb, A. (2018) Personal Kolb Learning Style Inventory Report. Experience Based Learning Systems. https://learningfromexperience.com/

Merriam, S.B., Bierema, L.L. (2014) Adult Learning: linking theory and practice. San Francisco: Jossey-Bass.