

## I. CANDIDATE INFORMATION

**First Name:** Jacob

**Last Name:** Waxman

## II. Capstone track and tentative title

**Capstone track:** film creation

**Tentative title:** Mobile Media Lab, Studio in a Box.

## III. design questions, technology, references, schedule

### Motivation

The motivation for my proposed capstone project has emerged from what I have learned through my courses at the Harvard Extension School coupled with the experiences I have gained at work while working towards my degree. As an instructional designer at the Center for Health Decision Science (CHDS), a school-wide center focused on decision making in public health, I run the Media Hub, an experimental digital environment to explore, experiment and prototype creative multimedia approaches for teaching, learning and communicating.

### General Context

There has never been a time that an educated and informed civically engaged society is as crucial as today. At the same time, the nature of higher education has changed, and while there are certainly opportunities, there are also formidable challenges. First, the body of scientific knowledge that exists is exploding, and educators and students alike are confronting new disciplines and new interdisciplinary areas of knowledge for which no pedagogical roadmap exists. Second, there is a paradigm shift in the contemporary student body, which now extends well beyond those in formal school. Educators are facing learners with more diverse backgrounds, different baseline levels of knowledge and skills, and a variety of learning styles. As institutions of higher education try and extend their reach, they are increasingly investing in online learning; how to create the most effective digital learning pathways and multimedia materials is a critically important question. Third, models of education – in particular higher education - are transforming. The “concept” of a classroom is far more nuanced today, as lines blur between physical and digital learning spaces, even within the walls of a brick and mortar university. Finally, and of particular relevance to educational multimedia, the availability of new technologies has outpaced the evidence about how to best use them.

While there is a need for multiple strategies in a variety of domains to address the challenges laid out above, **this project aims to address those that are most relevant to instructional design involving educational multimedia.**

### Need, and Significance of Proposed Project

While the toolbox of digital technology has expanded, history has shown us repeatedly that simply substituting the “old” for the “new” is rarely the answer. No technology is inherently good or bad for education – but it should be used in conjunction with how our student’s “think” and “learn”. The more we know about cognition and learning, how different mediums work, and how we respond to different stimuli, the more we can leverage that knowledge to innovate and design new models of instruction and create new tools for learning. But here is the dilemma. Those most comfortable with digital technologies and with the most expertise in educational multimedia are generally not the same as those with content expertise. Consider a typical university as an example: the online learning staff are the most familiar with the tools and technologies; the professors are the most equipped in terms of content expertise; and the cognitive scientists and educational researchers possess the cutting-edge knowledge about cognition and learning. New innovation in educational multimedia should consider input from each of these distinct communities. (*For my project, I will be paying particular attention to... or these issues are addressed by... ..*)

Particularly relevant to my focus on multimedia, there is another pragmatic set of considerations that presents a challenge. Educators are often operating in the context of limited resources—whether the constraints are limited time, funding, staff, or technology. For some faculty, there will not even be the option for creating and incorporating multimedia in lesson plans due to a lack of the tools and technologies. However, even for those with access to digital technology, they often have a limited amount of “taping time” or “studio slot” where they essentially give their lecture to a camera in an empty room. This is not only the least effective route to a high-quality multimedia learning product, it represents an enormous opportunity cost. The act of figuring out how to teach something is a complicated process that is consistently changing as the content gets updated, as the student pool changes, and as the instructor iteratively incorporates teaching experiences, learner outcomes, and student feedback. Pedagogic potential is highest at this moment, when the teacher is deciding how to teach a lesson in the planning and/or revising phase. Additionally, this point in the process is also where an instructor who is trying to innovate will be at their greatest vulnerability - taking risks and trying out new ways of teaching inevitably involves cycles of trial and

error. Faculty need a low-risk environment and the ability to experiment, observe, assess, reflect and iterate.

Based on what I have experienced in my work with the faculty in the CHDS Media Hub, the ability to experiment, prototype, and pilot in a low-stakes digital environment, in collaboration with an instructional designer versed in multimedia, can be a game changer. Faculty at CHDS have reported far more comfort with navigating between physical and digital spaces, drawing on a broad range of modalities in their lesson plans, and experimenting, failing, and iterating in general. Moreover, above and beyond creating multimedia educational products, nearly all report the acquisition of new pedagogical approaches and teaching skills. Motivated by this observation, I hypothesize that faculty with access to a portable modular “low-stakes” studio (herein referred to as “*mobile media laboratory*”), inclusive of instructional guidebooks, will more actively engage in “disrupting” the traditional architecture of conventional lesson plans – in other words, they will be more likely to take risks, create and pilot multimedia prototypes, and integrate multiple modalities into their teaching. Second, I believe they will build multimedia literacies, allowing for more effective communication and collaboration with online instructional design staff. Third, I believe these tools could be of unique value to “faculty teams” collaborating on multimedia educational products, in particular those trying to incorporate best practices of multimodal learning with interdisciplinary content. Fourth, I believe this will be a more accessible, efficient and cost-effective method to support faculty innovation in education at the institutional level.

### Proposed Solution or Novel Product and Estimated Users

The novel product is a **portable modular multimedia studio**, a **basic media design guidebook**, and a **specialty guide** that focuses on a particular set of skills, activities or products. Candidate specialty guides for the project include (a) best practices for designing multimedia educational videos; (b) using sketches and maps as cognitive tools for designing multimedia lessons; (c) storyboarding multimedia lessons for interdisciplinary topics; (d) the role of color as cues in the design of educational multimedia. One can think of the package described above as a “*mobile media laboratory*” – the purpose of the mobile lab is to create a low-stakes hub for experimentation, to prototype high value educational products, and to facilitate professional development.

This proposed product is a first step in what is a broader vision to enable and enhance innovation in instructional design through experimentation, collaboration, and low-risk prototyping. Ultimately, the success of this initial prototype would provide the foundation for a flexible “**studio in a box**” with modular components that would be tailored to different user objectives coupled with a community generated library of “specialty guidebooks”.

The potential “users” of this adaptive technology toolkit would be educators interested and motivated to experiment, prototype, and pilot multimedia educational products (e.g., for online classes, hybrid classes or to augment traditional brick and mortar classes). Initial candidate settings would include (a) departments and centers in schools and universities with interested faculty but without access to “low-stakes” experimental multimedia spaces (this would be the vast majority of departments in all of Harvard’s professional schools, as well as school-wide and university-wide centers); (b) community colleges with interested faculty without access to “low-stakes” experimental multimedia spaces and/or the ability to create multimedia educational products; (c) individual faculty with exposure and experience to the design and development of multimedia educational products, but wanting to do periodically engage in experimentation and prototyping as they design a new course, or embark on a new educational initiative. These initial “use cases” are based on discussions with faculty at CHDS, as well as workshops and faculty residencies held at the CHDS media hub.

The potential user profile might be much larger. For example, the adaptive technology toolkit could be (1) scaled “up” to a *greater number* of users (e.g., students, fellows, etc.) and (2) scaled “out” to a *more diverse* group of users (e.g., museums, non-profits, higher education institutions in middle-income countries, etc.). In addition, the “library” of specialty guides for different multimedia/multi-modal skills and interest areas would be enriched and populated by core media hubs (e.g., CHDS media hub, GHELI incubator, etc.) and through contributions of the community of users. This would result in a virtual community with exchange of ideas and shared learning.

### **Expected Measurable Outcomes of the Capstone Project**

**A completed functional mobile media lab prototype.**

The prototype would physically consist of one to two cameras, minor equipment, and a default set of teaching modalities, such as a curated toolbox of drawing pads and/or manipulatables that lend themselves well to visual and audio explanations.

Along with the peripheral equipment needed to run the two cameras, there would be a basic media design guidebook that would guide the user in how to create actual media, inclusive of pre-production, production, and post-production.

The prototype will be developed with a use-case scenario in mind – that of educator-development and small-scale production (i.e., creating a small video quickly for class).

The prototype will be pilot tested in at least two settings (e.g., high-school, community college, school of public health, etc.).

### **A completed “special interest guidebook”.**

One specialty guidebook will be completed. As described above, candidate specialty guides include (a) best practices for designing multimedia educational videos; (b) using sketches and maps as cognitive tools for designing multimedia lessons; (c) storyboarding multimedia lessons for interdisciplinary topics; (d) the role of color as cues in the design of educational multimedia.

The specialty guidebook will be pilot tested in at least two settings (e.g., high-school, community college, school of public health, etc.).

**Report on the outcomes of pilot testing.** In addition, this report will include the design plan for necessary modifications and roll out.

The long-term goals of the project have been outlined in earlier sections of this proposal. In addition to these (e.g., improved quality of educational multimedia, professional development, innovation in pedagogy) other long-term outcomes we would hope to contribute to would be improved learning retention, greater access to digital media tools for educational purposes, democratizing digital media tools for teachers, and crowdsourcing instructional design ideas for greater diversity and strength among teaching methods. These however would not be measurable within the time frame of the capstone.

### **Different Technologies Used and Why Needed**

### **Technology #1: Digital Capture Tools (Cameras, etc.)**

Reason: Camera gear will be the primary media tool used to catalyze review and feedback of educational materials. They also provide the tertiary media skills that are hoped for as a secondary goal.

### **Technology #2: Analog Materials (Drawing pads and markers, arts and crafts materials)**

Reason: Using the camera gear is primarily the extent of the media-heaviness of this kit- the activities that the “portable media lab” is facilitating should be somewhat similar to normal in-class activities, but enhanced through the tools and experience.

### **Technology #3: Web Development**

Reason: Building a housing for an instructional design/using the basic guidebook, as well as a housing for the “Library” of educational materials that are produced through the studio-in-a-box program. Perhaps a running instructional design blog as well for how to use the Box.

### **Works Cited**

Cambridge Handbook of Multimedia Learning – Richard Mayer

Frames of Minds – Howard Gardner

### **Tentative Schedule**

Tentative schedule with at least five milestone dates and one-line description of the deliverable.

### **Milestone #1: HILT Spark Grant Notice**

Date: July 1, 2019

Description: HILT Funding period begins - I should know before this date whether I get the funding for the HILT grant (This will be possible without the grant)

### **Milestone #2: Settle on Prototype Design**

Date: September 1, 2019

Description: Creating a prototype that will allow for small-scale production and development will require a few different attempts, and a testing run of each. Finishing this is integral to completing the instructional design guides and test-running the workflow, so this must be done somewhat quickly.

### **Milestone #3: Media Creation Workflow Created**

Date: October 1, 2019

Description: If the **mobile media lab** prototype is going to be able to be used by non-media professionals to create useable media, the workflow will need to be extremely streamlined and easy-to-use. By this date there should be a workflow for semi-automating the editing process.

### **Milestone #4: Basic Instructional Design Guide/Specialty Guide Created**

Date:

Description: The instructional design guide, that will guide users of rules of thumb to using the **mobile media lab** prototype with pedagogical best-practices (and guide them in exploring outside of the box on this front), while the media design guide will be a quick-start guide to actually creating useable media.

## **Milestone #5: Pilot Testing**

Date: November 1, 2019

Description: Pilot testing as described above.

### IV. PROJECT DESCRIPTION

Describe your project in two pages, including two or three visuals that you created on your own, e.g. graphs, diagrams, or sketches.

#### **Introduction**

I hypothesize that faculty with access to a portable modular “low-stakes” studio with simple digital tools (herein referred to as “*mobile media laboratory*”) and companion instructional design guides (herein referred to as “*blueprints*”) will: (1) more actively engage in “disrupting” the traditional architecture of conventional lesson plans; (2) develop multimodal competencies, allowing for more effective communication and collaboration with multimedia instructional design staff; and (3) collaborate more effectively as “faculty teams” with opportunities to couple the cognitive domain of multimodal learning and science of how students think, with interdisciplinary or discipline-based content and skills. In addition, I believe this will be a more accessible, efficient and cost-effective method to support faculty innovation in education at the institutional level. Ultimately, innovations along these lines would result in greater access to digital media tools for educational purposes, and contribute to democratizing digital media tools for teachers, and crowdsourcing instructional design ideas for greater diversity and strength among teaching methods.

#### **Rationale**

While the toolbox of digital technology has expanded, history has shown us repeatedly that simply substituting the “old” for the “new” is rarely the answer. No technology is inherently good or bad for education – but it should be used in conjunction with how our student’s “think” and “learn”. The more we know about cognition and learning, how different mediums work, and how we respond to different stimuli, the more we can leverage that knowledge to innovate and design new models of instruction and create new tools for learning



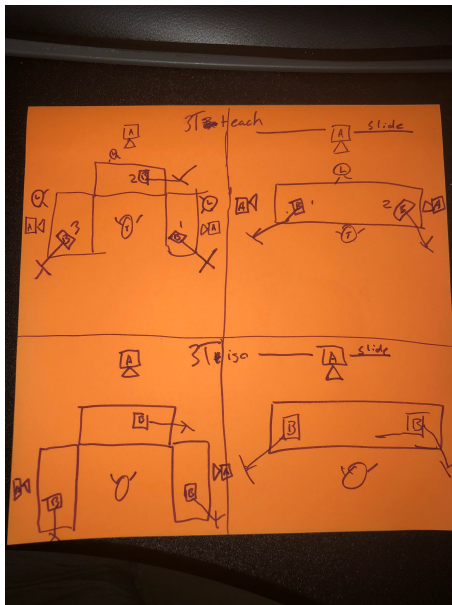
Particularly relevant to my focus on multimedia, there is another pragmatic set of considerations that presents a challenge. Educators are often operating in the context of limited resources—whether the constraints are limited time, funding, staff, or technology. For some faculty, there will not even be the option for creating and incorporating multimedia in lesson plans due to a lack of the tools and technologies.

However, even for those with access to digital technology, they often have a limited amount of “taping time” or “studio slot” where they essentially give their lecture to a camera in an empty room. This is not only the least effective route to a high-quality multimedia learning product, it represents an enormous opportunity cost. The act of figuring out how to teach something is a complicated process that is consistently changing as the content gets updated, as the student pool changes, and as the instructor iteratively incorporates teaching experiences, learner outcomes, and student feedback. Pedagogic potential is highest at this moment, when the teacher is deciding how to teach a lesson in the planning and/or revising phase. Additionally, this point in the process is also where an instructor who is trying to innovate will be at their greatest vulnerability - taking risks and trying out new ways of teaching inevitably involves cycles of trial and error. Faculty need a low-risk environment and the ability to experiment, observe, assess, reflect and iterate.

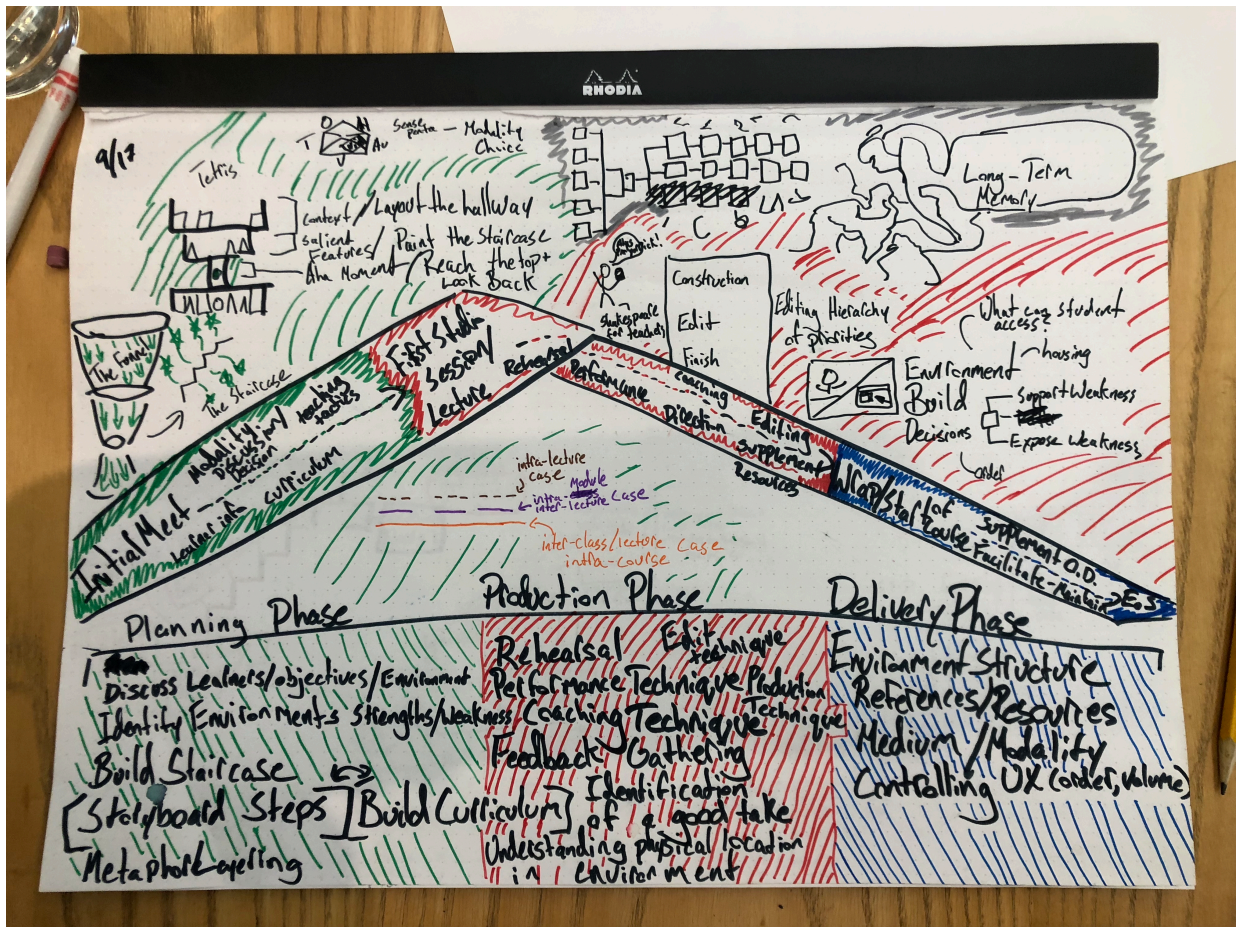
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My project will result in:

**A completed functional mobile media lab prototype.** The prototype would physically consist of one to two cameras, minor equipment, and a default set of teaching modalities, such as a curated toolbox of drawing pads and/or manipulatables that lend themselves well to visual and audio explanations. Along with the peripheral equipment needed to run the two cameras, there would be a basic media design guidebook that would guide the user in how to create actual media, inclusive of pre-production, production, and post-production. The prototype will be developed with a use-case scenario in mind – that of educator-development and small-scale production (i.e., creating a small video quickly for class). The prototype will be pilot tested in at least two settings (e.g., high-school, community college, school of public health, etc.). A sketch of a few possible set-ups is shown below.



**A completed “special interest guidebook”.** One specialty guidebook will be completed. As described above, candidate specialty guides include (a) best practices for designing multimedia educational videos; (b) using sketches and maps as cognitive tools for designing multimedia lessons; (c) storyboarding multimedia lessons for interdisciplinary topics; (d) the role of color as cues in the design of educational multimedia. The specialty guidebook will be pilot tested in at least two settings (e.g., high-school, community college, school of public health, etc.). A sketch of some of lesson-development tools laid out over their location in the production timeline that I have developed or use is below, which may be included in the guidebook.



**Report on the outcomes of pilot testing.** In addition, this report will include the design plan for necessary modifications and roll out.

**Broader Vision**

This proposed product is a first step in what is a broader vision to enable and enhance innovation in instructional design through experimentation, collaboration, and low-risk prototyping. Ultimately, the success of this initial prototype would provide the foundation for a flexible “studio in a box” with modular components that would be tailored to different user objectives coupled with a community generated library of “specialty guidebooks”.

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Of note, the eventual potential user profile might be much larger. For example, the adaptive technology toolkit could be (1) scaled “up” to a *greater number* of users (e.g., students, fellows, etc.) and (2) scaled “out” to a *more diverse* group of users (e.g., museums, non-profits, higher education institutions in middle-income countries, etc.). In addition, the “library” of specialty guides for different multimedia/multi-modal skills and interest areas would be enriched and populated by core media hubs (e.g., CHDS media hub, GHELI incubator, etc.) and through contributions of the community of users. This would result in a virtual community with exchange of ideas and shared learning.

The long-term goals of the project have been outlined in earlier sections of this proposal. In addition to these (e.g., improved quality of educational multimedia, professional development, innovation in pedagogy) other long-term outcomes we would hope to contribute to would be improved learning retention, greater access to digital media tools for educational purposes, democratizing digital media tools for teachers, and crowdsourcing instructional design ideas for greater diversity and strength among teaching methods.