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# VIDEO PRODUCTION AS A PATHWAY FOR BUILDING IDENTITY

How educators can use informal video production to facilitate educational, creative processes for students

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# INTRODUCTION

## The Power and Pitfalls of Video

*What are effective approaches in teaching digital media production and literacy and what skills are best built by these creative processes? This in-depth case study unpacks our instructional approach for and outcomes from equipping STEM-inclined students to become inspiring advocates for their fields through three years of a month-long course for MIT students to script and host science, technology, engineering, and/or math-related YouTube videos to inspire youth and facilitate meaningful learning.*

From Seneca's proverb, "Docendo discimus" ("When we teach, we learn"), to Jean-Pol Martin's "Lernen durch Lehren" ("Learning by teaching") method, to the more recently-coined Protégé Effect (Chase et al., 2009), there are examples of one instructional philosophy basically everywhere—a good way to learn something is to teach it (Frager and Stern 1970). And with the advent of smartphones, cameras, and apps good enough for feature film production (Marine 2015), and platforms like YouTube, Facebook, and Twitter, it's increasingly easier to shoot, edit, and distribute videos. Understandably, there's an appeal in combining these two phenomena and having students make videos as an educational exercise.

One issue is that video production, contrary to what we'd expect (Hakkarainen 2009), doesn't necessarily help students gain content or media production mastery (Schuck and Kearney 2006). Learning by teaching doesn't necessarily apply to teaching *through video*. In one study,

Relatively low levels of rigorous conceptual development relating to curriculum areas were noted... students' presentations of their final product often showed little evidence of any meaningful understanding of targeted concepts... Indeed, sometimes the technology seemed to be impeding conceptual understanding outcomes (Schuck and Kearney 2006).

I also observed this while teaching three iterations of a month-long educational media production course for MIT undergraduates, graduate students, and staff. *Becoming the Next Bill Nye* (<https://ocw.mit.edu/courses/biological-engineering/20-219-becoming-the-next-bill-nye-writing-and-hosting-the-educational-show-january-iap-2015/>) was a workshop-style class for students to develop basic scripting, hosting, and media production skills in the context of educational, digital media best practices, learning sciences, and engaging a non-technical audience with science, technology, engineering, and math (STEM) content. The students struggled with content accuracy and creating technically well-produced videos, and understandably so—educational media production involves so many different fluencies that it's unreasonable to expect students to master all of them, especially in a short period of time (Sweeder 2007).

Does this mean that making videos is a useless educational exercise? Absolutely not. While it may not always encourage content mastery, several studies have suggested that the process of video production can boost student engagement, self-expression, and creativity (Friesem 2014, Schuck and Kearney 2006, Grace and Tobin 2002, Hakkarainen 2009, Ranker 2008) and facilitate civic engagement (Goodman 2003). Students can use video as a tool to communicate, observe, and reflect, and in the process, develop media literacy skills, communication and presentation skills, and self-esteem (Schuck and Kearney 2006). *Becoming the Next Bill Nye* focused on facilitating student media literacy instead of technical proficiency and on building taste, critical analysis skills, and students' identity as STEM advocates. My key lessons learned on using video production as an effective educational process are to:

- 1) remember that there's no one-size-fits-all set of instructional elements, but rather general best practices and frameworks of thinking that should guide your instructional design.
- 2) consciously choose course elements based on the unique assets of the instructional staff and on your students' unique set of needs.
- 3) view video and digital media as materials with which to make meaning instead of items to consume. Videos themselves don't facilitate learning—it's the deliberate instructional approach of the creator manifesting itself in the media (Koumi 2015, Muller 2008, Mayer 2009, Mayer 2014).

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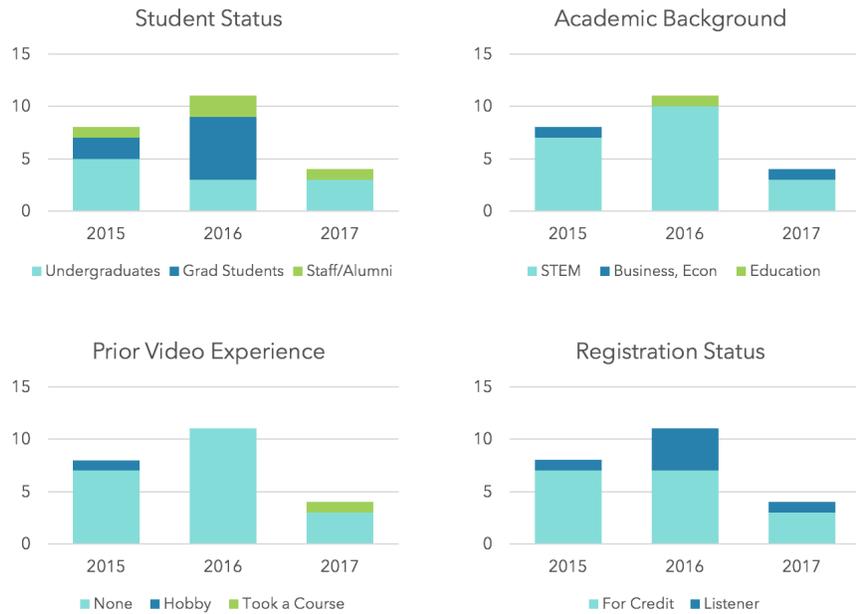
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# INSTRUCTIONAL CONTEXT & DESIGN

## Students

This course was open to any undergraduate, graduate student, or staff member. A total of 23 students enrolled during its three runs; Figure 1 illustrates their backgrounds. Our students had a very particular set of strengths (advanced technical content knowledge) and weaknesses (engaging with non-technical audiences). Almost all of them had STEM-related backgrounds and no prior video experience. They were more interested in being able to communicate their interests and work to their families, friends, and a broader audience rather than in video production.

Figure 1: Student Backgrounds



## Academic Institution

This class met three hours every day for three weeks over MIT’s Independent Activities Period, a four-week period during the month of January when students pursue independent projects or attend special seminars. Selected projects were professionally produced by MIT+K12 Videos, an educational media program, during an optional fourth week.

While there are several science communication courses and opportunities at MIT, they are generally focused on conventional science writing. The few video production classes on campus are geared toward documentary filmmaking. There are very few public speaking training opportunities.

The SUTD-MIT alliance, an exchange program between MIT and the Singapore University of Technology and Design, funded simple film equipment and guest speaker honorariums. This funding also allowed four SUTD undergraduate students to enroll as exchange students.

## Instructors

The staff backgrounds are illustrated in Table 1 on the following page:

Table 1: Instructor Backgrounds

2015		2016		2017	
Role	Background	Role	Background	Role	Background
Lead Instructor	Executive producer for educational web series, researches video-facilitated learning	Lead Instructor	Executive producer for educational web series, researches video-facilitated learning	Lead Instructor	Executive producer for educational web series, researches video-facilitated learning
Hosting Guest Lecturer	Full-time host, director, and producer of science television and video content	Hosting Guest Lecturer	Full-time host, director, and producer of science television and video content	Hosting Guest Lecturer	Full-time host, director, and producer of science television and video content
Instructional Designer/ Classroom Facilitator	Former middle school teacher, science communication coach	Teaching assistant	Undergraduate with experience in video editing, special effects, science writing	Post-Production Guest Lecturer	Full-time editor with experience in educational media
Videography Guest Lecturer	Documentarian, teaches video production courses at MIT				
Storyboard Guest Lecturer	Full-time animator, writer, producer				
Teaching assistant	Undergraduate with experience in video editing, special effects, science writing				

**Learning Objectives**

Based on the students’ needs, the staff’s expertise, the other offerings available at MIT, and my previous experiences producing educational videos with MIT students, I prioritized two broad goals: 1) help students learn how to speak to the public about technical content in an authentic and engaging way (instead of writing, lecturing, or giving a TED talk) and 2) empower students with self-awareness (“these are my strengths and weaknesses as a technical communicator”) and taste (“I think this educational video is effective/ineffective and this is why”). From there, I established these learning objectives:

Table 2: Course Learning Objectives

Thoughtfully, clearly, and engagingly communicate science, technology, engineering, and/or math content to a public audience through text, visuals, and sound.	Critically analyze digital media-based entertainment and education, particularly in the context of K-12 students and learning sciences.
Transfer production skills to future projects and/or achieve digital media literacy and appreciation.	Develop your own hosting and scripting style based on an understanding of what makes a successful communicator.
Understand the media production process from design to premiere of your own media projects.	

## Schedule

Workshop-style classes occurred every day. Table 3 outlines the most recent course schedule:

Table 3: Course Schedule, 2017

Week 1: (1 hr. lecture + 1 hr. class activity + 1 hr. project time) per day				
1. Concept and Format	2. Casting	3. Writing	4. Aesthetics	5. Distribution and Community
Week 2: Free working periods and workshops				
1. Independent Work Day	2. Independent Work Day	3. Hosting	4. Table Read	5. Post-Production
Week 3: Free working periods and screenings				
1. Independent Work Day	2. Independent Work Day	3. Rough Cut Screening	4. Independent Work Day	5. Final Screening

I encouraged students to use their phones or easy-to-use consumer cameras and provided a list of online tutorial resources for editing software. We spent very little class time (around 20 total minutes, total) teaching students how to use the cameras or editing software. Class time related to production techniques focused on the philosophy of production approaches, analyzing case studies, or specific tutorial requests from students.

## Assessment

How would we evaluate student competencies when the point of the class wasn't necessarily to make an excellently produced educational video? I wanted to acknowledge both talent and hustle so that my feedback was accurate and rigorous (i.e. if a video was poorly produced, it wouldn't receive an A just because the student tried hard), but also fair (i.e. individual improvements should be rewarded). I struck this balance with the grade breakdown illustrated in Figure 2. Students posted daily reflections and assignments to a course Tumblr (2015: <http://mit219.tumblr.com/>; 2016: <http://2s971.tumblr.com/>; 2017: <https://cmss62.tumblr.com/>) (each student signed a photo and material release form). Students could also respond to optional readings—mostly learning sciences research perspectives of multimedia for learning—for extra credit.

I graded each assignment in the context of four class values: spark, clarity, thoughtfulness, and challenge, as illustrated in Table 4 on the following page. Students wrote a final reflection on the shortcomings and successes of their final projects which counted toward the final project grade. For instance, a student who poorly made an animation wouldn't get penalized as long as they could point out why it wasn't successful and how they could improve it with more time, resources, or skills.

Figure 2: Grade Breakdown

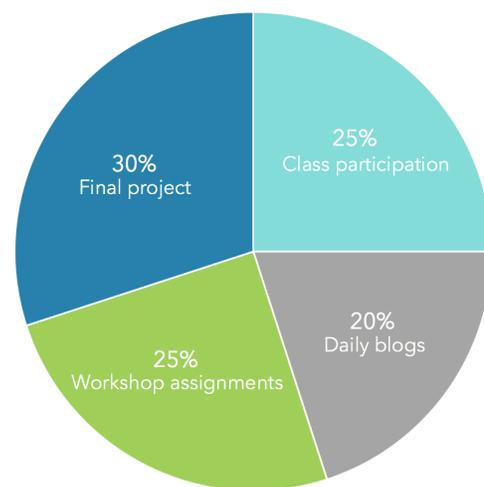


Table 4: Assignment Rubric

	Beginning	Developing	Exceptional	Points
<b>Spark</b>				
Are personality and passion evident and authentic? Do you engage your audience?	0 Bullet-point mentality. Minimal enthusiasm or interest in topic matter (inaudible or unnatural delivery, textbook-style script, etc..)	5 Some perceivable creativity and thinking-outside-the-box (integration of an unexpected element in script, variety of shot types used, etc.), work holds attention of audience.	10 Work exhibits a sense of authentic and natural wonder or vibrancy (host's body language and delivery is natural yet engaging, script emphasizes shareable fact, visual elements are engaging and deliberate, etc.). Material sparks curiosity. Recognizable creative risks taken.	/10
<b>Clarity</b>				
Are ideas successfully executed to quality final products?	0 Material is difficult to understand, see, or hear (overly verbose writing, incoherent storyboard, poor lighting and audio, etc.)	5 Material is discernable, though issues in cohesive written or visual narrative persist (story element is there but with excessive details, visual pacing is frenzied, camerawork is shaky, etc.).	10 Material successfully conveys ideas in clear and engaging manner. Script is tight and engaging, clear narrative, production value (good audio, sound, lighting).	/10
<b>Thoughtfulness</b>				
Do you demonstrate and understanding of the social and educational contexts of your material?	0 Material is inappropriate or irrelevant for middle school-level science background audience. Creator is condescending toward audience, no integration of class concepts into materials.	5 Clear efforts to integrate concepts into material evident in material itself or in daily blog reflection. Mostly copies templates set forth by already-existing materials (hosting style directly copying existing YouTube host, for example).	10 Creator clearly draws upon social and/or educational contexts of audience to engage and educate (wording is appropriate, blogs reflect understanding of the material fits into online video landscape, etc.). Every production decision is deliberate.	/10
<b>Challenge</b>				
Have you pushed your audience to grow? Have you done so in the process?	0 Content of material is of little depth or gimmicky, no growth of creator exhibited in material or blog posts.	5 Some growth of creator (improvements seen in material from previous iterations, reflections on blog, etc.), but incomplete adoption of feedback (may address only certain points, may not address points to the extent to which feedback specified, etc.). Material is sufficient but audience learns little that is new.	10 Evidence that creator is stepping outside a comfort zone, clear adoption and successful integration of feedback (addresses all points, blog posts demonstrate understanding of improvement opportunities in previous project iterations, etc.). Material is substantive.	/10

# COURSE DESIGN ELEMENTS THAT WORKED

## (and Why)

### Industry practitioners in the teaching team

Having the perspectives of established directors, animators, and hosts in our teaching staff was crucial in launching this class. They acted as coaches with good eyes and taste whose instruction essentially created an apprenticeship experience for students (Choe et al. 2015). If you don't have access to great educational media producers, that is okay and you can still win where you can. Your students can still have a valuable educational experience, but it will not (and should not!) look like ours.

### Learning objectives, especially related to hosting

Because I identified public speaking, writing for the spoken word, and understanding audio-visual complementarity as competency goals for the students, I required them to speak on camera. It was one of their biggest challenges and their largest opportunity for growth. This is why I prioritized the hosting workshop with a talented host/guest lecturer, even at the cost of reducing other parts of the class during future iterations.

### Overall sequence of "lectures"

Students struggled with progressing past the ideation phase and practicing production as an iterative process. The order of lectures and independent workshop time allowed them to practice this iterative, editing-and-re-editing process.

### Critically viewing many video examples as texts

Students exhibited three levels of understanding during this class:

Table 5: Levels of Student Understanding

I. Conceptual Understanding	
Explanation	Example
Student understands a principle of multimedia design at a theoretical level.	Student understands Richard Mayer's Personalization Principle, which suggests that speaking naturally in a video (i.e. in first person, active voice, with contractions) is better at facilitating learning than formal, academic styles of writing (Mayer 2009).
II. Critical Analysis	
Explanation	Example
Student can identify effective or lack of implementation of abstract strategies in example videos.	Student can identify Mayer's Personalization Principle in action in a video or can analyze the inefficacy of a video due to its lack of Personalization.
III. Original Implementation	
Explanation	Example
Student can implement abstract concepts into an original project and make that intentional implementation visible in plastic elements of the project.	Student recites a naturally written script that she/he wrote.

Showing several example videos in class gave us tangible case studies from which students' critical analysis could emerge during class discussions. However, it was all the more reason to have teachers with taste and experience in production guide this meaning-making with students.

### Students workshopping prepared materials

Analyzing case studies was useful for students, but it was still just a heuristic for actually producing good videos. Transferring knowledge into original practice was an entirely different challenge, which was best facilitated by making the students workshop prepared materials. For the writing workshop, we taught strategies for writing for the spoken word in the context of workshopping and critiquing actual student writing in front of the whole class. Not only did this give concrete feedback to the student about their original work, but it also set examples of constructive feedback for the students. I also workshopped and criticized my own writing and material during class. For the hosting workshop, every student had to host their rough draft in front of the class while being filmed. Though it seemed like a trial-by-fire, two students reflected after the hosting workshop:

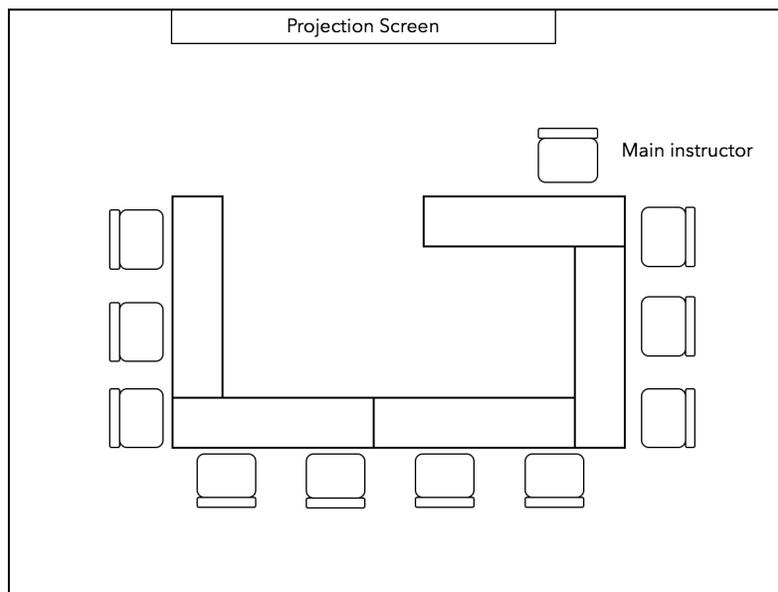
I talk science to my colleagues every day, so the types of conversations I engage in and the writing I do seem to be skewed more towards the technical side. Because this style has become so second nature, it was difficult to write the script draft with an accessible and conversational voice... For the hosting portion... to be honest, I felt really shy and nervous but I'm glad that I tried it. I appreciated the feedback from everyone and with more practice I hope to feel more comfortable being recorded. Whenever I watch a video of myself, I'm like do I really sound like that?!?! (Hess 2016)

...after reading my script, I started questioning whether or not I was speaking down to my audience, if my confidence sounded false, if my enthusiasm sounded hollow, if my mannerisms and way of speaking were distracting. I think that Ceri was absolutely right in pointing out that there are some things that can only be improved by actually getting in front of a camera. (Ho 2016)

### Classroom setup

Due to the workshop-based nature of the class, no more than ten students were in class on a given day, which maximized individual feedback. A roundtable classroom setup facilitated discussions and critiques. I would cap enrollment at ten students for any future class.

Figure 3: Classroom Setup



## Rubric and grade breakdown

Because of our grade breakdown, the average grade on the bigger assignments, like the script rough draft and video rough cuts, was a C (i.e. prioritizing proficiency), but students who completed all assignments with a good faith effort and exhibited growth and self-awareness in their reflections ultimately received an A in the class.

## Class blog

The blog was one of the most useful components of the class. I used Tumblr for its informality and relevancy in the type of online communities for which the students were producing videos. Self-reflections are a good tool to give students practice writing informally, writing authentically in their unique voices, producing low-stakes video (via vlog entries), and critically analyzing and reflecting on their own work and the work of others (Choe and Goldstein 2015, Schuck and Kearney 2006).

I wrote daily blog reflections alongside the students, which made me deliberately reflect on my teaching practice and established expected levels of authenticity for the students. Students seemed more willing to open up about things like feeling overwhelmed on their blogs rather than in class; their entries helped me keep track of how they felt, what they were getting out of the class, and how I needed to adjust my lectures.

Most importantly, the blogs allowed student learning to become visible, similar to a think-aloud method (Ericsson and Simon 1993, Johnstone et al. 2006), unhindered by the biases of self-reported surveys or class evaluations, which are notoriously unreliable (Reich 2015, Kahan et al. 2016, Uttl et al. 2016). Most of the blogs were freeform reflections, but for reflections that accompanied bigger assignments, I asked students to specifically think about aspects of their assignment of which they were proud and that they would improve with more time or resources. One student (of listener status) didn't even make a final video, but his blog reflects the kind of growth for which we aimed:

This course freed me from my earlier naïve notions of what online instruction should look like. I started with a view that I needed to create videos of lectures – after all, this is what other profs do. So my initial hope... was to figure out how to create instructional videos. But as I...talked to [the instructors] and students, my view broadened and I gradually changed my perspective. No videos for my online course!!! Wow, that was revolutionary... (Pavlov 2017)

Keep in mind that the self-awareness reflected in this blog maps directly to our objectives—not all classes should let students get away with not making a final video!

# COURSE DESIGN ELEMENTS THAT DIDN'T WORK

## (and Why)

### Students workshopping their scripts with middle schoolers

For the first two runs of the class, students workshopped their video ideas and scripts with a local seventh grade class. This was a useful exercise to expose the students to an audience with less technical expertise, but it would have been much more productive to give the seventh graders scripts in advance to critique with the guidance of their teacher, instead of expecting them to provide instant feedback. For the third run, students were given more project time instead of time with the seventh graders, which proved just as useful.

### Spending too much class time on theoretical concepts

For our students with no video background, class time was most useful when it was as immersive and hands-on as possible. Concepts like Richard Mayer's multimedia principles for learning (Mayer 2009) and learning sciences literature were more helpful when students actually practiced implementing them. Spending more time on theoretical concepts would be more valuable to students who already have some technical production proficiencies. Similarly, storyboarding didn't seem to help students—it was more useful for them to get their hands on a camera as soon as possible, given our time constraints.

### Relying on peer feedback for meaningful guidance

Peer assessments are important exercises for teaching students how to critique, but they're often unhelpful to the student receiving them (Hakkarainen 2009). The students didn't develop their own senses of taste to provide meaningful feedback until the end of the course. Because the workshop occurred over such a short period of time, it was difficult to rely on peer feedback to provide enough, or even appropriate, guidance for students as they developed their projects. Taste takes time to develop. Silvia Gherardi argues that

Taste is a sense of what is aesthetically fitting within a community of practitioners—a preference for 'the way we do things together'. Taste is based on subjective attachment to the object of practice and is learnt and taught as part of becoming a practitioner; it is performed as a collective, situated activity within a practice. The elaboration of taste and the refining of practice within a community involves taste-making, which is based on 'sensible knowledge' and the continual negotiation of aesthetic categories (Gherardi 2009).

Deliberate practice and skills building isn't enough to develop taste—in order to go from proficiencies to creating this deliberate aesthetic and taste, the student has to have some talent and/or more extensive apprenticeship with skilled practitioners to develop a good eye (Macnamara et al. 2014). For such a short course, some peer feedback was useful—offering comments in-class while workshopping projects was much more helpful than having students write out in-depth peer critiques. But the teaching staff played a crucial role in offering the detailed bulk of the feedback and guiding taste-making.

## CONCLUSION

*Becoming the Next Bill Nye* was purely a clickbait title—this class was not actually about turning into a Bill Nye persona, but about identifying one’s unique identity as an educator of technical content. My objectives as the instructor were to build competencies and taste in hosting, public speaking, and “winning where you can,” not to build technical proficiencies and turn students into incredible video producers. I wanted students to develop this level of self-awareness:

Out of the entire experience, from ideation to script writing to shooting to editing to repeat, it would be easy for me to stick with the part I feel most comfortable with—the script writing part. But we only get growth when we throw ourselves at the things we suck at. It was reiterated when my sister-in-law (an artist) posted something on Facebook... namely that when you create art, often it’s pretty bad when you first start out. And because you have good taste, you \*know\* it’s bad. And often, that’s when people quit, because of that gap between what you want to accomplish and what you did accomplish.

I’m so glad I didn’t quit this class. But it was close there for a while...

...While I can’t say I’m happy with my final product... I can say that it was much improved over the rough cut. And looking back I’m somewhat proud of what I have learned. (Desrosiers 2015)

Depending on your students’ backgrounds and interests, and the expertise and taste of the instructors, you might decide to focus on other fluencies. Sometimes, it might be better to focus on the technical elements of production and less on speaking in front of a camera. But by focusing learning objectives, informed by the needs of the students and the expertise of the teaching staff, video production can give students a meaningful learning experience (Choe and Goldstein 2015).

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