

1) What is the **real-world problem or concern** to be addressed in the dissertation study?

All the world is a studio

The Web has resulted in significant shifts in the creation and dissemination of media. The expense and scarcity of media distribution that once required content producers to rely on publishing houses, recording companies, printing presses, and movie studios is becoming increasingly obsolete. Any individual with access to technology now has the opportunity to create and distribute his or her work, and this has significantly changes the landscape of every information-based industry and service. Record companies struggle with obsolete revenue-generating models, book-publishers panic for relevance, journalists compete with bloggers, and user-content generated sites like Youtube and Vimeo birth pop-cultural phenomenon that exceed the viewership of network television programming. A father with a camera phone and nitrous-oxide induced son can now garner more eyeballs than a prime-time cable news program. In this changing media landscape we need to understand how these shifts in media consumption and production are playing out in educational media.

The most popular video sharing service, Youtube, has thousands of videos created for the express purpose of teaching users a variety of skills ranging from knitting, building a computer, drawing, cooking a particular dish, house-training a dog, and everything in between. In March 2009, YouTube announced the launch of YouTube EDU (<http://www.youtube.com/edu>), where viewers can find an organized collection of YouTube channels produced by college and university partners. At the end of its first year, YouTube EDU had grown to include more than 300 colleges and universities and over 65,000 videos of lectures, news, and campus life. These are freely available for public viewing and these videos are only a portion of the content on YouTube with potential educational value (Greenberg, 2010). The exact quantity of online video available via Web 2.0 sites is unknown, but the figure has been estimated at nearly 35 million hours of video content (Snelson, 2011). A report from

Pew Internet & American Life suggests that 69% of U.S. Internet users watch or download video online and 14% have posted videos (Purcell, 2010). Video accounts for 26.15% of global broadband traffic (Cisco, 2010) with over one third of the 50 most heavily visited websites being video sites. Internet traffic rankings from Alexa (2010) and comScore (2010) reveal that YouTube is the most highly visited video destination of them all.

Teachers as producers

Youtube caters to a wide audience with interests so vast it exceeds the scope of this study. On a more practical level, Youtube is often blocked in schools and thus the material available (or not) to teachers would be mostly irrelevant within the instructional day. My intention is to attempt to characterize the current state of content creation and sharing that exists on one particular content sharing site called TeacherTube. Despite its potential educational usefulness, Youtube contains a great deal of content that could be vexing for K-12 schools.

In light of problems with using YouTube for K-12 education, Jason Smith, a Superintendent from Texas, his wife, and younger brother founded TeacherTube in early 2007. Smith founded the site to answer the question, "Why can't teachers, students, and schools utilize the power of the read/write web for learning?" Since 2007, TeacherTube has found a niche among educators as it boasts the similar user-friendliness and accessibility to Youtube but with a greater control for school-appropriate content. By July of 2008, TeacherTube contained over 26,000 videos and by October of 2010, it had over 725,000+ users and over 200,000 educational videos. The site gains more than a million page views per month. The site's focus on teacher created educational videos offers an intriguing opportunity to explore teacher created media.

The power of user-generated video for education is readily apparent. To be sure, teachers have long been innovators and creators of their own professional tools, and sharing those tools is a long-

standing tradition among teachers. Sharing lesson plans, worksheets, and booklets locally has long been a part of the K-12 teaching profession. What has changed more recently has been teachers' access to video production software and the Web's ability to provide far-reaching video dissemination opportunities. TeacherTube is one of the most successful and "sticky" of all teaching-content sharing sites and as such, makes it ripe for analysis geared toward better understanding what teachers are sharing and what other teachers find useful and valuable. While there has been a good deal of scholarly interest in student-aged children's production of digital media (Ito, 2007; Jenkins, 2009) there has been practically no research on teachers-as-producers or teacher produced media.

Scientific content on TeacherTube

With such an enormous volume of web video, it would be impossible to analyze the site as a whole. Instead of thinly exploring content from the site in general I intend to deeply explore a single "channel," that is, a part of TeacherTube that groups together like content. Given my background and experience I am particularly interested in the science channel. Scientific issues influence a variety of core public policy concerns, and a basic understanding of these issues is crucial for civic engagement in a democratic society. Science education must aim to produce students who are prepared to not only to "increase economic productivity through the...knowledge...and skills of the scientifically literate person" but also "engage intelligently in public discourse and debate about matters of scientific and technological concern" (Yager, 2006, p. ix). In light of my own interests, and general needs for science education I intend to focus on the science videos.

Due to my background as a former high school chemistry and physics teacher as well as a science education game designer with National Geographic, and now a technology specialist at Fairfax County Public Schools, I am especially interested in how science is portrayed on TeacherTube and what it means when teachers are the primary producers of science education videos. The growing

accessibility of video production and sharing via many-to-many channels is an unprecedented opportunity for teachers to take control and ownership over educational media in a way that has never before been possible. While it is only a small number of teachers that currently engage in such production and sharing opportunities, their numbers are growing and the role of user-generated video in education is likely to continue to grow as well. Yet we know very little about what is out there and who the teachers are who are creating these materials. This study will attempt to lay the foundation in what is sure to be a field of emerging importance in educational research.

2) The kinds of research questions that might be targeted in conducting a study in this area of inquiry.

A) What types of science education videos are being shared on TeacherTube?

For instance, who is the intended audience? Is it for reference, professional development, or to be shown directly to students? What genres do teachers employ? How-to-videos, lab safety, or demonstrations are potential examples. In this case, I would be interested to compare and contrast the kinds of videos teachers create with long-standing traditions in educational science videos.

B) How does a teacher start (or “get into”) sharing videos on TeacherTube?

What type of technology support does the teacher get from school or home (both in terms of hardware, software, and instruction)? What gave them the confidence to share their work? What experiences prompted them to think this would be a worthwhile activity?

C) What does the teacher “get out of” sharing videos on TeacherTube?

What are the incentives for the teacher? What feedback has she/ he gotten? Do students know about the teachers' contributions? How do students react to this information? What feedback/ support/ concerns are voiced by colleagues, administrators, parents?

3) The theories, concepts, research literatures, and methodological approaches that are likely to guide the dissertation study.

A) Some important theories guiding this research include:

- *Distributed Cognition*- A theory in cognitive science that proposes that human thinking is not embodied within the person/ mind. Rather it is distributed and contained in tools and in other individuals. (Hutchins, 1995).
- *Realism*- Realism is particularly useful to this dissertation because of its approaches to diversity and culture, and the emphasis on a mechanistic (as opposed to correlation) to examine causes. (Maxwell, 2011).
- *Symbolic Interactionism*- This is going to be one lens through which I will view the data. Symbolic Interactionism places values on theories based on how good they are at solving complex problems, and looks at the symbols people use in order to create and negotiate meaning. Symbolic Interactionism has found its way into a lot of research on online communities because the it helps us, “translate the world from a physical sense reality into a reality that can be understood, interpreted, dissected, integrated, tested. Between reality and what we see and do stands the symbol.” (Charon, J.M., 2007).
- *Sociocultural Learning Theory*- Looks at learning as a constructed, self-regulated, goal oriented process that must be done as part of a larger cultural context. For adult learning, I'd cite (Lave, 1996).
- *Participatory Culture*- This is a relatively new theory that is meant to be the binary to consumer culture. The idea is that technology empowers many people to do for themselves tasks that were once only accessible to skilled, specialized laborers. Participatory culture decentralizes knowledge and empowers those who are comfortable with the technological tools while “leaving behind” those who are either uncomfortable or cannot access the tools. All of these issues brought on by participatory culture have a direct impact on education and educational institutions, although they are as yet poorly understood and under-theorized in educational research. (Jenkins 2009).

B) Below is a preliminary sample of work that I believe will inform the conceptual context of this research:

American Association for the Advancement of Science (2001). *Designs for Science Literacy: with companion CD-ROM*. Oxford University Press, USA.

Bennett, S., Maton, K., & Kervin, L. (2008). The “digital natives” debate: A critical review of the evidence. *British Journal of Educational Technology*, 39(5), 775-786. doi:10.1111/j.1467-8535.2007.00793.x

Bonk, C. J. (2009). *The World Is Open: How Web Technology Is Revolutionizing Education*. Jossey-Bass.

Charon, J.M. (2007). *Symbolic Interactionism: An Introduction, An Interpretation, An Integration (9th Ed)*. Upper Saddle River, NJ: Prentice Hall.

Chinn, C. A., & Malhotra, B. A. (2002). Epistemologically authentic inquiry in schools: A theoretical framework for evaluating inquiry tasks. *Science Education*, 86(2), 175–218.

Chmiel, M., & Burton-Peters, E. (2011). Just Bare-Bones Facts”: STEM Career-Switchers’ Perceptions the Role of the Nature of Science in Science Education. Paper presented at the National Association of Research in Science Teachers (NARST) Annual Conference, Orlando, FL April 3-6.

Hutchins, Edwin (1995). *Cognition in the Wild*. Cambridge, MA: MIT Press.

Jenkins, H. (2009). *Confronting the challenges of participatory culture: Media education for the 21st century*. Cambridge, MA: MIT Press.

Jones, C., Ramanau, R., Cross, S., & Healing, G. (2010). Net generation or Digital Natives: Is there a distinct new generation entering university? *Computers & Education*, 54(3), 722-732.

Lave, J. (1996). Teaching, as learning, in practice. *Mind, Culture and Activity* 3: 149-164.

Maxwell, J. (2004) *Qualitative Research Design: An Interactive Approach (2nd Ed)*. Thousand Oaks, CA: Sage Books.

Maxwell, J., & Chmiel, M. (2010). Rethinking the concept of "culture" in education. Presented at the College (of Education and Human Development Faculty Symposium. Fairfax, VA. February 1.

Maxwell, J. (2011) *A Realist Approach for Qualitative Research*. Thousand Oaks, CA: Sage Books.

Snelson,C. (2011) YouTube across the Disciplines: A Review of the Literature. *MERLOT Journal of Online Teaching and Learning*, 7(1). Retrieved from:

http://jolt.merlot.org/vol7no1/snelson_0311.htm

Purcell, K. (2010). The state of online video. Retrieved from the Pew Internet & American Life Project website: <http://pewinternet.org/Reports/2010/State-of-Online-Video.aspx>

Provenzo, JR, Provenzo, E. F., Jr, Shaver, A. N., & Bello, M. (2010). *The Textbook as Discourse: Sociocultural Dimensions of American Schoolbooks*. New York, NY: Taylor & Francis.

Rudolph, J. L. (2002). *Scientists in the Classroom: The Cold War Reconstruction of American Science Education*. Palgrave Macmillan. New York: NY.

Wolf, M. (2007). *Proust and the Squid: The Story and Science of the Reading Brain*, Harper, New York: NY.

C) Below are some initial thoughts toward research approaches

Potential Sampling Approach

A total of 100 videos will be pulled during various points throughout the year, allowing me to identify videos by date posted, thus enabling other patterns such as total views and popularity to emerge. The researcher will look at 25 videos once in July, once in October, once in January, and once in March in order to create a snapshot of activity at different points of the school year. I will exclusively query the “science” channel in order to see the broadest selection of science video types. The videos are defined by the user, thus anything that has been defined or tagged as “science” will be considered for the analysis. The risk that something was mis-tagged by a user or creator is endemic to user-generated content, and for this reason, it would be disingenuous to second-guess or censor the data. Even with these precautions, it is worth noting that the lifeblood of any social sharing website is the influx of new content. A static site is a sign of Internet death. New content brings new page hits. Therefore, no study of a social website can offer more than a snapshot in time. It is also important to note that TeacherTube allows users to post and share documents, images and other media. While these are clearly important media for teachers, they are outside the scope of this study. These videos will be analyzed and coded according to the procedure found below and used to create categories and classifications. From these categories and classifications, I will target specific teacher contributors for follow-

up interviews to shed insight about how teachers got started as contributors, and what their incentives are for contribution.

Procedure

The researcher will document the following items for purposes of descriptive statistics:

- 1) Title of the video
- 2) Name of the author
- 3) Number of other videos the author shared
- 4) Date the video had been uploaded
- 5) Total views of the video on TeacherTube as of the date of the research
- 6) Numbers of “favorites” from other users
- 7) “Apple” rating (a “stars” type of rating)
- 8) Numbers of comments as well as a transcription of the comments

Each of the videos will then be downloaded so that they can be used with video data coding software.

The videos will be coded via open-coding in order to “fracture” the data and put it into categories facilitating the comparison of data within and between these categories. This is done to develop theoretical concepts (Maxwell, 1996) about the content of the videos. The coding categories will be developed by the researcher, but will draw from genre conventions consistent with science-oriented video such as “how-to” “chemistry demonstrations,” “nature-footage” and others that may be recognizable to a general audience. An initial coding structure will be generated via a research pilot study, but these codes will be kept relatively open to be employed as needed to best describe what is sure to be dramatically different content. The codes emerging from this initial analysis will be entered into a codebook to later be used by a second rater. Both raters will nominate videos to be captured via rich description in order to provide readers with a full, deep, picture of the content. The videos that will end up in the final report will be decided upon by consensus of the raters.

A second pass at analysis will be performed in order to identify the types of scientific epistemologies

and dispositions conveyed in the video. This analysis will employ emic categories taken from other published analysis of textbooks, tradebooks, software, and web sites and based on the models of how people evaluate and represent scientific data. These are useful tool to characterize what is being conveyed and develop ideas and themes about the types of science that readily lend themselves to this particular medium should we see consistencies or trends emerge. As with the open-coding in the previous step, this analytic component will be subject to inter-rater reliability and the raters will nominate and decide on providing rich descriptions illustrative of the categories that emerge using this analysis. I'll be interested to see to what degree some of the patterns that emerged in Chmiel & Peters-Burton (2011) will arise in the analysis of video artifacts, and I plan to keep a close eye on the analytic codes employed in that study, as I anticipate that they will provide a useful lens in this current analysis.

If the researchers encounter content on TeacherTube that falls outside of currently accepted, mainstream scientific knowledge (for instance “intelligent design” UFOs, “evidence” of ghosts, etc.,) these will be included as part of the research data, but in a designated genre and with some attempt to characterize the author’s use of evidence and data while noting that the content describe falls outside of scientific norms.

Descriptive categories of videos will be used to paint a spectrum of the types of videos that are available on TeacherTube. From these emerging categories, I will select 3-4 individuals to follow up with form an interview to address the issues raised in questions of , “How does a teacher start (or “get into”) sharing videos on TeacherTube?” and “What does the teacher“get out of”sharing videos on TeacherTube?”. The questions will be structured so that they are behavior driven first (for instance, when did you post this, what software did you use, do your colleagues use this, etc.,) and then ask for teachers interpretations on these matters during the later parts of the interview (“What are your incentives to post these videos?”). In doing so, we can document as much of the teachers recall knowledge as possible before introducing threats of reflexivity into the teachers as they interpret their experiences. While both types of interview data are valuable, they may need to be analyzed differently

and this consideration will guide how the interview protocol is generated. That said, I imagine that after each interview, I will need to reflect and memo on the data that was gathered so that I can remain flexible to the types of issues that arise and be sensitive to the importance I am placing on a diversity of voices in this process. For this reason, the interview protocol will remain open-ended overall.

Addressing threats to validity

In order to provide validity to my data, I propose the following:

- 1) Rich data descriptions will be provided for several videos, especially as exemplars of coding. As part of the rich descriptions, screen-shots of videos may be provided if they are found to be illustrative of a data point. Rich data are “detailed and complete enough that they provide a full and revealing picture of what is going on” (Maxwell, 1996, p. 95). Ideally, these data go beyond providing a source for supporting instances, they serve to test developing theories. However, I will supply a source of sorts by including an appendix of video URLs will be provided so that readers of the study can access the video data on their own and verify that the videos appear as described.
- 2) Simple descriptive statistics will be provided in conjunction with the rich data. These quasi-statistics are particularly useful because I will be analyzing a large amount of data and quasi-statistics will enable me to assess the amount of evidence in my data as it relates to conclusions or potential validity threats.
- 3) Inter-rater reliability will be used during the coding of genre and the scientific epistemologies
- 4) I will use reflective memo-ing throughout the process in order to continue to be aware of my biases and to aid in the coding processes.
- 5) For interview data, I will use member checks for data representation and analysis that I gather from my interview participants.

Limitations

I'd like to use the limitations section of my dissertation not as a place to “apologize” for what my study doesn't answer, but rather to do some thought-work about qualitative research online. Part of my

ambition for this project is to thoroughly examine the limitations endemic to studying interaction on a particular website. In other words, I want to carry over my understanding of instructional design to thinking through problems of how website designs can place very different types of limitations on what types of research can be performed. That is to say issues such as user interface, comment moderation, systems for “favorite-ing”, opportunities for sharing, downloading, and distributing are all very different from one website to another, and these differences will facilitate or limit research in different ways. Current literature on online research tends to look at the online environment as a unified place, different from “the real world”. I would like to spend time in this dissertation examining how and why different web designs will limit the types of research possible, and what that means for the maturing field of online, qualitative research.

A second limitation that I hope to embrace is that this study is not about generalizing or trying to paint a portrait of the average teacher or the average Teacher Tube user. Rather, I hope to better understand the different ways in which teachers create and share their media. Another critique I would offer about current research in online communities is that the scholarly research analyzes online communities using the culture-as-capitulation model. To be sure, I believe there is a lot of room here to introduce the alternative understandings of culture championed by Maxwell (Maxwell & Chmiel, 2010) in the analysis of online communities by describing the differences in values, background, content, motives, and incentives participants bring in their participation.

4) Areas of expertise that will need to be represented on the dissertation committee.

- Qualitative research methods/ mixed methods
- Issues in communication of science education
- Design or analysis of digital, educational artifacts
- Studying online communities and communication
- Video analysis