



visible knowledge project

a collaborative investigation of learning, inquiry, and technology



The Difference that Inquiry Makes:

A Collaborative Case Study of Technology and Learning,
from the Visible Knowledge Project.

Edited By Randy Bass & Bret Eynon



"The Difference that Inquiry Makes: A Collaborative Case Study of Technology and Learning, from the Visible Knowledge Project," *edited by Randy Bass and Bret Eynon*

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Michael Coventry, Georgetown University
Matthias Oppermann, Humboldt University

From *The Difference that Inquiry Makes: A Collaborative Case Study on Technology and Learning*, from the Visible Knowledge Project¹, edited by Randy Bass and Bret Eynon

Introduction: Storytelling, Database, Protocol

Technologies create possibilities for new ways of doing things while simultaneously absorbing older practices in an uneven movement forward and backward. In order to analyze the relationship of technology and change, media theorists distinguish between technologies of delivery and “technology protocols.” Lisa Gitelman defines “media as socially realized structures of communication, where structures include both technological forms [technologies of delivery] and their associated protocols.” In Gitelman’s account, media protocols “include a vast clutter of normative rules and default conditions, which gather and adhere like a nebulous array around a technological nucleus” [or the technology of delivery].² This idea is useful for helping scholars of teaching and learning think through the impact of new media technologies on the practice of capturing and representing evidence of student learning and drawing conclusions from it.

This essay explores how the protocols surrounding particular new media technologies shape the ways we think about, practice, and represent work in the scholarship of teaching and learning. Our case study is grounded in several years of research on student-produced digital stories. As part of

¹ About VKP: In all, more than seventy faculty from twenty-two institutions participated in the Visible Knowledge Project over five years. Participating campuses included five research universities (Vanderbilt University, the University of Alabama, Georgetown University, the University of Southern California, Washington State University, and the Massachusetts Institute of Technology), four comprehensive public universities (Pennsylvania’s Millersville University, California State University (CSU)--Monterey Bay, CSU Sacramento, Ohio’s Youngstown State University, and participants from several four-year colleges in the City University of New York system, including City College, Lehman, and Baruch), and three community colleges (two from CUNY--Borough of Manhattan Community College and LaGuardia Community College, and California’s Cerritos College). In addition to campus-based teams, a number of independent scholars participated from a half dozen other institutions, such as Arizona State and Lehigh University. The project began in June 2000 and concluded in October 2005. We engaged in several methods for online collaboration to supplement our annual institutes, including an adaptation of the digital poster-tool created by Knowledge Media Lab (Carnegie Foundation), asynchronous discussion, and web-conferencing. The VKP galleries and archives (<https://digitalcommons.georgetown.edu/blogs/vkp/>) provide a wealth of background information, including lists of participants, regular newsletters, and reports and essays by participants, as well as a number of related resources and meta-analyses. For this article, the author gratefully acknowledges the students whose work is cited here. All students whose work is included have granted the author permission to use the material.

² Lisa Gitelman, *Always Already New: Media, History, and the Data of Culture* (Cambridge: The MIT Press, 2006), 205. <https://digitalcommons.georgetown.edu/projects/digitalstories/>

this project, we have gathered evidence of student learning through video interviews and created an online, searchable database of interview clips. This database is not merely a technological add-on to our research process. Building on Gitelman, we suggest that we should not just think about a new technology of delivery (such as evidence of student learning stored in a searchable database), but about how that new technology of delivery impacts practice (what are “normative rules and default conditions” which result from the database). Thus, our project foregrounds the expressive power of the database to render findings and evidence of student learning in a multimedia format, and simultaneously underscores the impact of new media protocols on the practice of the scholarship of teaching and learning.

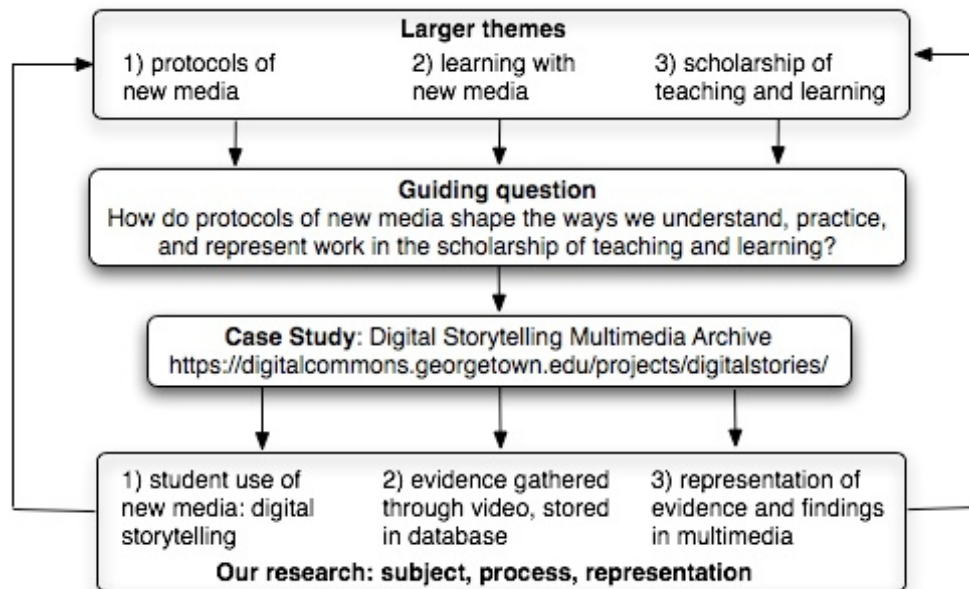


Figure 1: Relationship between larger themes, questions, and case study

The multimedia representation of our evidence and findings is available online as the Digital Storytelling Multimedia Archive.³ It is the subject of our case study that investigates the relationship between the protocols of new media, the nature of student learning with multimedia, and the scholarship of teaching and learning. We are particularly interested in the potentialities of new media protocols to both supplement and challenge the linear, hierarchical, causal narratives that characterize the trajectories between evidence and findings in more traditional modes of representation.

While others have observed that a key affordance of databases for academic work is to allow the evidence layer to be present with the argument (see for instance In the Valley of the Shadow Web site and the American Historical review article built on it), in most cases, the user encounters several layers of argument which ‘drill down’ into representations of the evidence (maps, tables, etc.).⁴ As one way of representing our project, we have built a similar, hierarchical scheme as

³ <http://digitalcommons.georgetown.edu/projects/digitalstories/>

⁴ <http://valley.vcdh.virginia.edu/>; <http://www2.vcdh.virginia.edu/AHR/>.

well (see Figure 2 below). But the database allows the flexibility to imagine other representations (such as our two-dimensional grid) that change the relationship of evidence and argument. The possibility also presents itself to allow users to ‘play’ in this data themselves, developing new arguments based on the interview clips, student papers, and digital stories, and using Web-based tools not only to search our data, but to combine it into research narratives of their own.

Research Questions and Process

Thinking with clarity about the role of technology is key when research focuses on the use of technology in the classroom and when the presentation of that research takes advantage of new media technologies. Towards the end of the Visible Knowledge Project, a group of faculty began to adapt the idea of digital storytelling from a community development purpose and began to think about how to study its effects on student learning. Digital stories are narratives combining images and video from personal and digital archives, voiceover, music, and text into short (3-4 minute) multimedia movies. Digital stories emerged in classrooms on Latina feminisms, popular culture, gender studies, American Studies, U.S. cultural history, and English as a Second Language. While all aspects of the VKP’s research agenda were fascinating (as the other essays in this volume make abundantly clear), digital stories seemed to provide an especially convergent place for the concerns of the project, addressing issues of not only disciplinary practice (what does cultural analysis look like?) but also technological change (what does analysis look like in digital spaces?). This convergence made further study seem like a fruitful way to leverage both existing work (the result of several years of the virtual and face-to-face discussions of the Digital Storytelling Group of the VKP) and to work forward into evolving, emergent, classroom practices. And so the coauthors embarked on a study of digital storytelling, based in culture, theory, history, and language classrooms at Georgetown University, California State University-Monterey Bay, and LaGuardia Community College, CUNY. The results of this study are available in print (see AHHE Forum on Digital Storytelling, Vol. 7.2, 2008) and also online at the Digital Storytelling Multimedia Archive.⁵

In each of the classrooms we studied, digital storytelling was embedded in larger processes that mirror conventional approaches to research. Students develop topics, read secondary and theoretical literature, draft autobiographies, write proposals or theorizing essays, and create storyboards, among other activities.⁶ There is a somewhat familiar relationship between research and writing which underpins student work; however, because students are working towards a digital end, they are already thinking about their work as being different—more visual, more compressed, and more public than traditional writing products. Because we wanted to explore both the conventional and the particularly digital aspects of student learning in digital storytelling, we began the project by thinking about how to triangulate several kinds of data to gain a more complete picture of what was happening. In addition to products of student learning (such as multimedia projects and the various kinds of written

5 See also Michael Coventry, Peter Felten, David Jaffee, Cecilia O’Leary, and Tracey Weis, with Susannah McGowan, “Ways of Seeing: Evidence and Learning in the History Classroom,” *The Journal of American History* (March 2006), <http://www.historycooperative.org/cgi-bin/justtop.cgi?act=justtop&url=http://www.historycooperative.org/journals/jah/92.4/coventry.html>

6 At Georgetown: Michael Coventry’s courses in popular culture and visual culture studies, and Dean Bernard Cook’s course American Civilization III; at CSUMB: Rina Benmayor’s course Latina Life Stories; at LaGuardia Community College: Liz Iannotti’s courses in English as a Second Language.

planning and reflective material which accompanied them) we began thinking about interviews as one way to capture both some of the thinking that had gone into the digital storytelling process for students as well as a way of beginning to assess any carryover the experience brought to students' subsequent academic careers.

The principal investigators of this project, Matthias Oppermann and Michael Coventry, began to gather examples of student-produced digital stories, and the various written components of the assignments, and to video tape interviews with students and faculty on the three campuses. We conducted a total of thirty interviews and reviewed hundreds of digital stories and written assignments. Our research was guided by three central questions:

1. What is distinctive about the kinds of immersion we witness in research, production, and presentation that is specific to digital storytelling?
2. What are the advantages of digital storytelling in the area of student engagement?
3. How do digital stories speak to the relationship between emotional and epistemological dimensions of learning and cultural critique?

We explored these themes by asking students about their process in creating the digital story ("what was the hardest part of the creative process?"); its relationship to other academic work ("in what ways do you think your writing in other courses has changed through your experience working with a digital story?"); and questions of audience ("did you share your digital story with someone outside the classroom? what feedback did you receive?"). At the end of our first round of interviews, we had about fifteen hours of raw video footage to work with. To make this footage more manageable for analysis and representation, we decided to translate the material into another format, following the protocols of a database.

From Codes to Findings: The Semantics of Evidence

The next step in our research process was to select noteworthy segments (anywhere from 30 seconds to 2 minutes) from the interviews and to code them. Our intention was that these codes would help us to sort and organize important parts of the interviews into answers to sub-issues of our three guiding research themes. Our coding process loosely followed a qualitative social science model of having one person create codes and the other test them, with room for modification and refinement along the way. Our exploratory intentions and our own disciplinary inclinations to moderate our claims meant that we were not concerned to make our process a completely transparent social scientific one.

Our first pool of selected clips was very large (15 hours distilled into a 5 hour clip reel). To make the process of coding more manageable, we created a database (a simple Excel spreadsheet at first) with several columns. We then (re-)viewed each selected interview segment, one student or faculty member at a time, and assigned the initial codes to each clip.

Student	Possible Code	Clip #	Clip Times	Clip Content
Archuleta, Don	emotional/epistemological / story-theory	1	03:20;05 - 03:42;26	How oral history by real people helps understanding the past
Archuleta, Don	emotional/epistemological	2	03:48;05 - 04:05;26	Personal touch vs. text book approach

Our intention was to organize groups of “findings” for each of our main research questions. These would be statements about more refined aspects of that larger research agenda. Each question would be answered by a ‘general finding’ which synthesized the smaller, more targeted sets of findings, each cluster would have a general finding, and then each of the more granular statements would have a statement of finding as well as a link to evidence.

The database design allowed us to sort interview clips by codes into larger clusters. Since all interview clips in the database were linked to certain codes, we simply had to use the “find” feature to pull semantic clip clusters from the database. By reviewing the clips in each cluster, we were able to deduce a more ‘general finding’ that built coherence around the more granulated findings.

Section	Subsection	Clips	Comments
Emotional/Epistemological	story/theory	Chui 9+14	Personal side of history makes time period richer (9)/his project does not create a new history, but enriches existing ones (14) - contrast to Charea 5:"making history all over again"
		Kathy 1	How the story/theory is embedded in life, not external to it

As we pushed from codes towards clusters and finally findings, having these ‘chunks’ of data easily accessible was central to our research process. Our general findings resulted in three main categories (multimedia distinctive, student engagement, emotional/epistemological) that spoke directly to our main research questions, with subsections (codes from interviews/more granular findings) and evidence becoming subsumed under or flowing from these three main categories. Thus, the result of our process of categorization was a genuine tree structure that allowed us to reconfigure the database relationship between evidence (interview clips) and findings (codes) into a hierarchical, linear narrative.

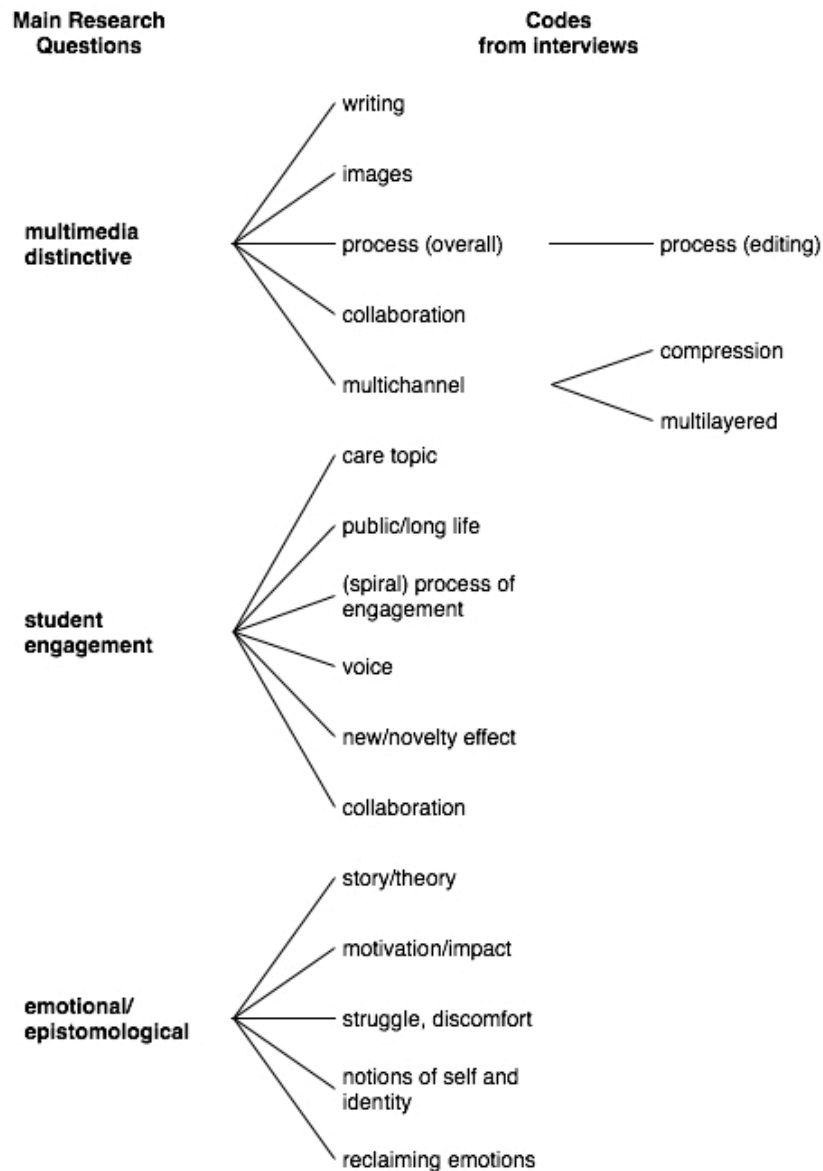


Figure 2: The three main research questions and their corresponding codes from the interviews

This tree structure became the basis for the initial information architecture of our Digital Storytelling Multimedia Archive. If the protocols of the database were expressive of the relationship between evidence and findings in our research process, then the tree structure of our linear representation clearly followed a different logic. From a list of unordered items of evidence that existed all on the same level, we had moved –through selection and categorization– to a linear, hierarchical, cause-and effect trajectory. Thus, we began to think about how we could best render the database logic of the relationship between findings and evidence visible through representation.

One attempt to retain the protocols of our database in the linear Web site was to represent layering. Thus, we preserved the main columns of our spreadsheet through their representation as different layers: Guiding Question, General Finding, more granular finding, and evidence supporting this finding. In the area of social pedagogies, for example, we synthesized the following general finding for the entire section:

Social Pedagogy

Guiding Question: What makes Digital Storytelling social pedagogies; what are the advantages of digital storytelling in the area of student engagement?

General Finding

Digital Storytelling allows students to work on authentic assignments, develop their personal and academic voice, represent knowledge to a community of learners and receive situated feedback from their peers. Due to their affective involvement with this process and the novelty effect of the medium, students are more engaged than in traditional assignments. These factors can create a "spiral" of engagement, drawing students into deeper and deeper engagement with their topics.

General Finding and Guiding Question

Findings and Clips:

- Students Care Deeply About their Topics in Digital Storytelling Assignments
- Digital storytelling is public work
- Digital Storytelling Assignments can result in a spiral of engagement for students
- Digital Stories give students' voice
- Digital Stories are a New Medium
- Student Engagement and Collaboration

Figure 3: General Finding for the "Social Pedagogy" Section

We then grouped our ideas into clusters with further synthesized statements. For instance, one of our clusters within student engagement was the notion that student care about the topics they choose for digital storytelling assignments.

3.2.1 Students Care Deeply About their Topics in Digital Storytelling Assignments

Guiding Question: How does the design of digital storytelling assignment result in deeper student engagement?

General Finding: Digital Storytelling's combination of video, sound, images, and student voice creates an environment where students become deeply invested in their topics. Students are able to work on projects that are affirmed by sources both inside and outside the academy. Student's connection to a topic is deeply embedded with their sense of digital storytelling as public work. Students often write their stories for a particular audience or to 'speak back to' a dominant discourse.

Finding One: Relevant Research

Digital storytelling helps students work in issues that have relevance both in the classroom and the world beyond. Students can be inspired by—or have their work affirmed from— sources inside and outside the academy.

General Finding and Guiding Question

Findings and Clips:

- Students Care Deeply About their Topics in Digital Storytelling Assignments
- Digital storytelling is public work
- Digital Storytelling Assignments can result in a spiral of engagement for students
- Digital Stories give students' voice
- Digital Stories are a New Medium
- Student Engagement and Collaboration

Figure 4: Cluster of findings in the "Social Pedagogy" Section

This finding was, then, supported by a series of more granular statements based on interview clips and other ties to evidence. One of these granular findings statements is given below. This one focuses on the ways that students can imagine a real audience for them outside the classroom because digital stories are a short 'movie.' This sense of audience is something a traditional written paper can rarely achieve.

Finding Two: Digital storytelling is academic work that students want non-academics to hear and understand

Digital storytelling's form lends itself to students' desire to do academic work for broader audiences. Even when students may not be successful in doing this, they intend for their projects to speak to people outside the classroom instead of only to the professor.



Figure 5: Granular Statement of Findings (3.2.1.1.1.1) and supporting evidence (interview clips)

This granular statement above is supported by four interview clips that are pulled from our database, e.g the clip "Inga 15," which says that she was writing against homophobia on her campus, or the clip "Mingo 4" about what it was like to show his project to an uncle. Our database had represented those interviews as follows:

Codes	Clip	Times	Notes
engagement: public and also engagement: care topic	Inga 15	23:40;12 - 24:23;26	Writing back against homophobia and bigotry, writing for myself and people who have been tokenized
engagement: public	Mingo 4	24:15;05 - 26:18;20	Audience response: story entertaining to uncle, Mingo offended at first, but story catalyzed conversation

This layering of questions, findings, and evidence preserves some aspect of our database, but it simultaneously flattens the relationship between evidence and findings into a linear narrative. The layering thus reduces the database to the preexisting hierarchy of our cause-and-effect trajectory. The ways in which the evidence is “controlled” by means of stable categories, clear hierarchies, and limited cross-references is indicative of the incunabula stage of our multimedia representation. One could argue that this shows an affinity to the logic of the Internet of the 1990s, which had been primarily about representing complexity with static links, and hierarchy through categories (top-level and sub-directories). In contrast, making information accessible and visible in dynamic ways (e.g. through the use of content management systems) is a central feature of social software technologies. In new media lingo, our naming of clips and the use of the find feature could be called “browsing by meaning,” an essential feature of recent developments associated with Web 2.0. In this sense, our collaborative process for the creation of codes is very similar to the practice of “tagging” (or assigning keywords to) information such as happens on social bookmarking sites like del.icio.us or technorati. Accordingly, part of our planning from the beginning was to make the entire set of tagged clips—including the ones not actually selected for the ‘findings’ document—available to researchers as an online archive. In this way, other scholars could explore not only what we had chosen as the most relevant clips, but also other clips which had been tagged in a similar way, adding their own connections and creating alternative narratives for the relationship between findings and evidence. What was needed, then, was a way to make the database dimension of our project not merely additive to, but expressive of the complexities of student learning with multimedia. Thus, we had to reconsider how the protocols of the database could help us to both practice and represent work in the scholarship of teaching in Web 2.0 environments.

Twisting the Framework: From Hierarchy to Grid

In addition to this hierarchal Web site focused around our three main research questions, in conversations with Randy Bass we began to think about alternative ways of organizing and representing what we had learned in the digital storytelling project. To that end, we created an online grid of findings.⁷ This allowed us to remap our primary codes, findings and sections. Two of our three main sections, along the horizontal axis, basically stayed the same (“emotions and argument” and “engagement”),

but we added a new third section called “rethinking expertise,” which folded in our category about the

⁷ The grid (<https://digitalcommons.georgetown.edu/projects/digitalstories/grid/>) is based on one developed by CNDLS (<http://cndls.georgetown.edu/>) for Georgetown's Berkley Center for Religion, Peace, and World Affairs (http://berkeley-center.georgetown.edu/databases/religious_perspectives).

distinctiveness of multimedia. Here is our description of the new category from the grid:

Click on a field in the grid to see examples of how digital storytelling works at the intersection of horizontal and vertical categories. The first tap displays relevant findings statements from our original findings document. Layered beneath these statements is a second tap with excerpts from the interviews that our findings are based on.

	Rethinking Expertise	Emotions and Argument	Engagement
Authoring	<p>Rethinking Expertise</p> <p>Digital storytelling opens up new opportunities for students to work towards expert-like thinking in the humanities.</p> <p>The complex, multilayered, multi-media nature of a digital story forces students to construct stories with that complexity in mind. The design of many digital storytelling assignments—such as telling personal or family histories or presenting analysis of a popular culture artifact—makes digital stories more like authentic work within cultural studies.</p> <p>Experts analyze such complex, 'real' stuff, and so asking students to do the same facilitates students movement along the path towards expertise.</p>		
Layers			
Compression			
Editing			
Audience			

Figure 6: Description of “Rethinking Expertise” from the Grid

Our vertical axis consists of five categories (“audience, editing, compression, layers, authoring”) that are roughly equivalent to the clustered level of our codes. When a user clicks on a term from either axis, a description like the one above appears. Clicking on a box at the intersection of two terms (for instance, “rethinking expertise” and “authoring”), displays relevant findings statements pulled from our original, hierarchical findings document. Layered beneath these findings statements are several pieces of evidence on which they are based (exactly as in our hierarchical Web site).

[Introduction](#) [Multimedia Distinctive](#) [Social Pedagogy](#) [Affective Learning](#) **[Grid](#)** [Archive](#) [About](#)

This grid is an alternative, condensed representation of our findings from this project. Our main findings are represented in three broad categories on the horizontal axis ("Rethinking Expertise, Emotions and Argument, Engagement"). Click on a top category to read a brief description of the main finding. The vertical axis consists of five categories ("audience, editing, compression, layers, authoring"). These are the top categories of codes that we distilled from evidence of student learning.

Click on a field in the grid to see examples of how digital storytelling works at the intersection of horizontal and vertical categories. The first tap displays relevant findings statements from our original findings document. Layered beneath these statements is a second tap with excerpts from the interviews that our findings are based on.

Rethinking Expertise		Emotions and Argument	Engagement
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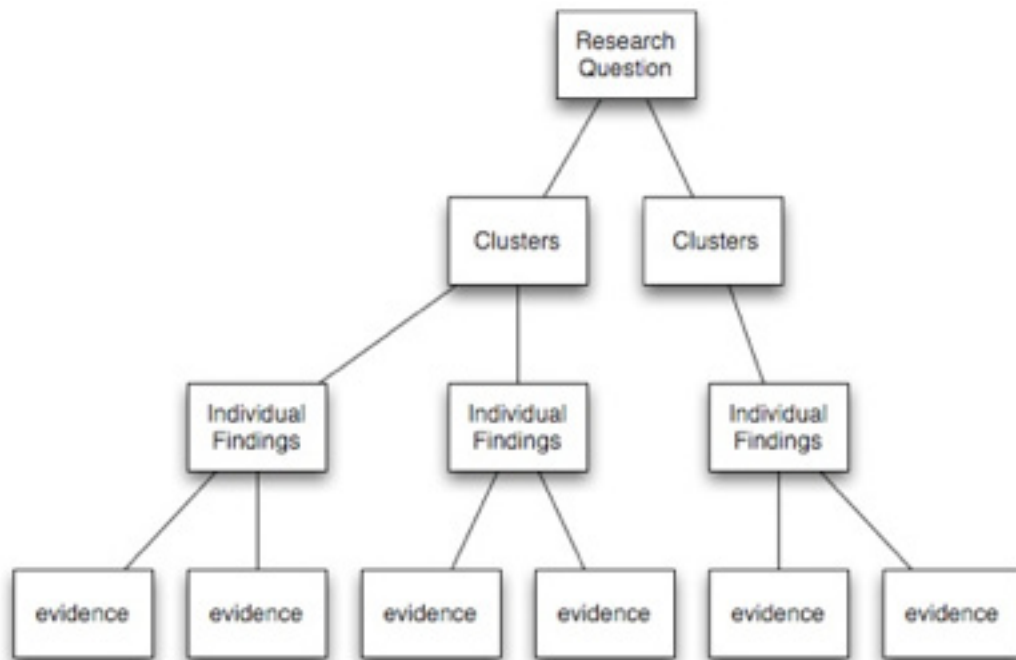


Figure 8: First, we organized our research using the design of a hierarchical Web site (or an outlined document/tree structure) as a model. Under this frame of reference, evidence points upwards through findings into separate “silos” of answers to one of the three primary research questions.

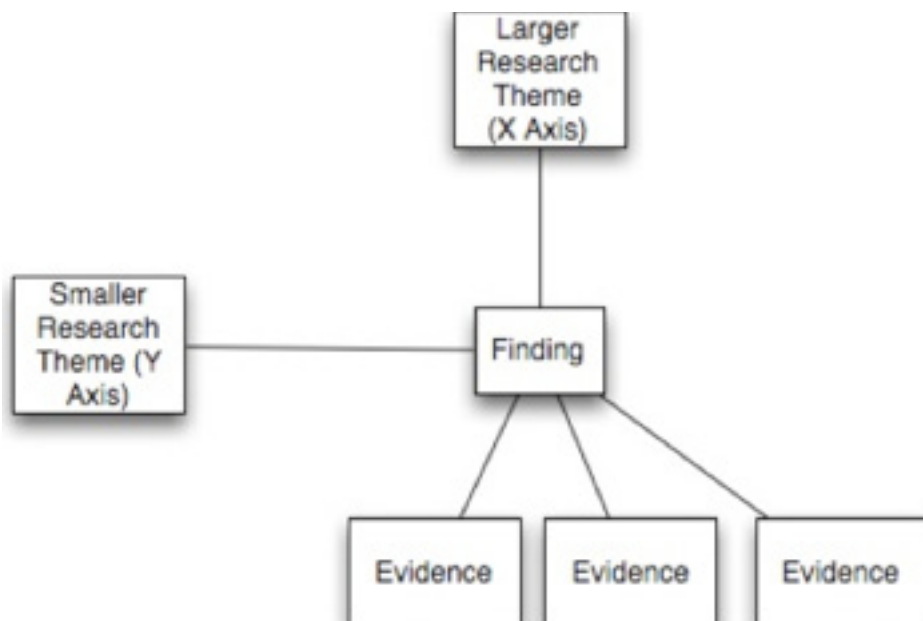


Figure 9: Another way to organize research uses a grid as its model. Under this organizing principle, each set of findings and evidence points to both a larger research theme (equivalent to one of our original questions) and to a smaller research theme (equivalent to the cluster level in the hierarchical model).

Rethinking the findings in this way proved very helpful in our further synthesis and connection of

the project to larger themes. It also does not diminish the value of our hierarchical website. Indeed, many users may find the more traditional website a more comfortable way to approach the data, as that approach is more familiar. However, users who spend time with the grid will find that by forcing connections to two themes at once, it represents each piece of evidence more accurately. The complexity of learning is difficult to capture and represent—as everyone who has ever tried knows—and time spent thinking about the connections and cross-referencing presented in the grid reminds us of that complexity and multidimensionality.

This representation is hardly emblematic of the full potential of multimedia, as the grid is still a relatively rigid representation only allowing for two linked themes rather than the constantly looping, citational, and multilayered reality of the performance of learning. Nonetheless, the grid is indicative of the shift from representing the relationship between evidence and findings as a linear trajectory to making the protocols of the database that authorize this linear narrative more visible. This is not a radical reversal in the media protocols of representation, but rather a shift in degree and constellation. Thus, the grid designates a liminal space between the protocols of database and linear narrative in a multimedia environment.

Conclusion: Evidence, Narrative, Database

The tension between grid and linear Web site as two related, yet fundamentally different ways to represent evidence of student learning is one of the most challenging aspects of our meta-study. Our grid underscores—especially in its limitations—the dialectic between evidence of student learning as data, and the attempt to represent this data as a progressive, hierarchical, and linear narrative. The media protocols of traditional publications in the scholarship of teaching and learning clearly privilege the latter (as do virtually all fields in the academy), and the “normative rules and default conditions” of these publications follow the hermeneutics of linear, hierarchical, cause-and-effect narratives.⁸

However, as Lev Manovich has pointed out, the database is the privileged narrative of the computer age, and its logic is fundamentally different from that of linear print narratives.⁹ The consequences for our project of capturing and representing evidence of student learning are direct: Theoretically, every item in our database is just as significant as any other. Thus, our evidence (clips or texts as single items in the database) and our findings (also items) exist on the same level in the (non-)hierarchy of the database. Likewise, there is no hierarchical relationship between different categories of findings, such as higher-level clusters and subordinate individual findings. According to Manovich, this absence of hierarchy is symptomatic of the database as “cultural form:”

As a cultural form, the database represents the world as a list of items and it refuses to order this list. In contrast, a narrative creates a cause-and-effect trajectory of seemingly unordered items (events). Therefore, database and narrative are natural enemies. Competing for the same territory of human culture, each claims an exclusive right to make meaning out of the world.¹⁰

Initially, our research design had relied on hierarchy and restriction in order to reduce the complexity

⁸ Gitelman, 205.

⁹ Lev Manovich, *The Language of New Media* (Cambridge: MIT Press, 2001), 194.

¹⁰ Ibid 199.

of our evidence base, and to create a cause-and-effect trajectory. Throughout our study, we restricted the number of interviews, and limited the number of our initial research questions, our codes, and consequently our findings. Hierarchy became a means to control the material in the database: a top level of research questions, a second level with clusters of general findings, then more granulated findings at a tertiary level, and so on. With this process, we had to selectively insulate our narrative from the database, because the material in the database constantly threatened to deconstruct both our categorization/hierarchy and the linear narratives we had chosen to privilege. Each single item that existed in the database, but was not included in a particular findings category, would have forced us to refine or qualify our findings statements. Likewise, the virtually unlimited number of possible combinations among items in the database would have imposed the need to constantly re-phrase and re-consider not only our privileged findings, but also the questions most central to our project. As a place where database and linear narrative meet, the grid brings this tension between hermeneutics and deconstruction into sharp relief.

The narrative of our findings, then, can only be maintained under certain conditions, and is closely related to our currently existing categories. As Clay Shirky has pointed out, reducing complexity through categorization works well only if certain criteria are met. First, in terms of the domain of knowledge to be organized, classification is dependent on a "small corpus, formal categories, stable and restricted entities, and clear edges." Second, successful classification assumes "expert catalogers, an authoritative source of judgment," as well as "coordinated" and "expert users."¹¹ One of our goals for this study is to make our findings publicly available in an online archive, accessible to the scholarship of teaching community and beyond. For such an environment, Shirky adds, reducing complexity through stable categories is a "bad strategy:"

Users have a terrifically hard time guessing how something they want will have been categorized in advance, unless they have been educated about those categories in advance as well, and the bigger the user base, the more work that user education is. [. . .] The more you push in the direction of scale, spread, fluidity, flexibility, the harder it becomes to handle the expense of starting a cataloguing system and the hassle of maintaining it, to say nothing of the amount of force you have to get to exert over users to get them to drop their own world view in favor of yours.¹²

In our collaborative work for this study, we have benefited tremendously from critical exchanges about evidence of student learning. In fact, our most compelling findings resulted precisely from the opportunity to hold multiple interpretations of a single piece of evidence in tension with each other. If we understand our work as a case of collaborative knowledge production in the scholarship of teaching, then our stable codes and categories do not represent authoritative judgment ("own world view in favor of yours"), but rather point to the limitations of the first stage of our project. To explore questions of student learning more fully, we invite other scholars and students to engage with our evidence base and to share their findings in the next stage of our project. Through collaborative

coding/tagging and the production of further metadata in a collaborative effort with the academic

¹¹ Clay Shirky "Ontology is Overrated: Categories, Links, and Tags," Clay Shirky's Writings about the Internet: Economics & Culture, Media & Community (2005), http://www.shirky.com/writings/ontology_overrated.html.

¹² Ibid.

community, we aim to push the limits of analyzing and representing student learning in Web 2.0 environments.

While the hierarchical Web site is an important and useful representation of our work and our findings, the grid has forced us to fundamentally re-conceptualize the relationship between our findings and our evidence. Ultimately, however, we hope to transform the online archive into a genuinely communal and collaborative space of knowledge production. We trust that this will disrupt and deconstruct the narrative of our preliminary findings in the most generative ways, and mark a point of convergence at the intersection of the scholarship of teaching and learning and the Digital Humanities.