# Tweeting on the Backchannel of the Jumbo-Sized Lecture Hall: Maximizing Collective Learning in a World History Survey[1]

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TWITTERER? Tweet? Retweet? TweetDecks? Hashtags? Geotags? Does tweeting poorly reveal one to be a twit, or even a nitwit? Preparing yet again, for the third time, to teach a world history course (History 100) enrolled with approximately 400 students, I braced for what I knew was a recurring problem in the "jumbo-sized" lecture: namely, the primarily uni-directional (professor to student) nature of the course dynamic. The prospect of lecturing to/at the anonymous crowd had me wondering why I even needed to be there in person. Did a person at the front of the room offer any advantage over a taped lecture, I pondered? While I longed for student questions and the interactivity that inquiry could bring, two semesters of teaching a class of over 400 students had taught me that entertaining questions from the crowd privileged the foolhardy and bold (and usually male) student who was willing to speak in front of hundreds of peers, rather than the good, thoughtful (and often female) questioner struggling with inchoate ideas. Although I had heard of a concept called "backchannel learning," and was eager to open that backchannel to transform the one-way nature of the conversation into a bi- or even multi-directional learning environment, I had not yet settled upon a technology that could facilitate the interactivity, responsiveness, and engagement for which I yearned.

## Background

In early 2011, the world gaped in awe as social media, such as Facebook and Twitter, fueled the Arab Spring. News organizations followed revolutionary developments via TweetDecks, which allowed them to track, from the ground-up, the burgeoning revolution in a way that traditional media were unable to report.[2] Scholars, reporters, and other pundits have begun analyzing the impact of technology on the Arab Spring, offering as conclusions snappy one-liners such as: "The medium can lead to the message"; "Online crowd dynamics mimic offline crowd dynamics"; "'little' technologies—cell phones, text messages, CDs, flash drives, Twitter—are critical to circumventing totalitarianism."[3] These observations on the role of social media in the Arab Spring held the promise of a radical transformation of the jumbo-sized lecture course. Imagine the potential parallels on each of these points for the lecture hall filled with hundreds of students usually forced into silence (or worse, silent disengagement). Was it possible that in the same way online social networks politicized Arab youth, these same networks could be used to historicize students in an introductory history course? As history students saw the online dynamic of their peers interacting via Twitter with the ideas in the lectures, would they become emboldened to engage the ideas more deeply and begin to ask questions of their own? Could I circumvent my own totalitarian control of the classroom dynamic by encouraging student use of Twitter in order to overthrow the traditional hegemonic control of the lecture hall and spur the students to take the lead in their own learning of the material? While the contexts of revolution against tyrannical regimes and the controlled environment of the jumbo-sized lecture course are of course dramatically different in content and stakes, I nonetheless asked myself: Could Twitter spur the revolution in multi-directional active learning that I so desired in my jumbo H100 class?

But, in May 2011, my optimism for the pedagogical possibilities of micro-blogging via social media was challenged by the Twitter scandal featuring Anthony Weiner, a U.S. Representative from New York. Accused of sending images of "bulging underpants" via his Twitter account, Weiner initially claimed his Twitter feed had been hacked.[4] The *New York Daily News* ran a poll asking readers, "Do you believe Rep. Anthony Weiner's statement that his Twitter account was hacked to send out a lewd photo?" and found a near-even split between respondents replying, "Yes, He's clearly the victim of a malicious hacker" or "No, I think he meant to send that obscene photo."[5] Although Weiner's claims of Twitter-hacking ultimately proved false—there were questions from the start about Weiner's convoluted assertion that it was a hacking of his Facebook account that

led to this yFrog photo being posted to his Twitter feed[6]—cyber security experts, potentially motivated by self-interest, did opine on the ease of hacking a Twitter account, especially when passwords are easily broken with publicly available information (pet names, etc.) or with malware. An interview at the time noted, "'From a pure technical perspective, it's easy-peasy' to hack into a Twitter account, said Dave Marcus, director of security research at McAfee Labs."[7] News stories later in 2011 proved Twitter-hacking to be a real possibility, with two highly publicized examples of news agencies whose feeds had been hacked—in one case, a Fox News tweet falsely alleged the assassination of the President; in another, a NBC News tweet falsely reported a plane crash at Ground Zero in New York City.[8] Hacked account or not, Weiner's mistake was a costly one, and offered to any public figure, educators included, a useful lesson on the public nature of Twitter and the need to take care with one's official persona when using a Twitter account.

Indeed, the promise and pitfalls of Twitter played out quite publicly in the first half of 2011. In addition to these news-making uses of Twitter, examples of Twitter's use for troubleshooting pedagogical conundra had already begun to proliferate. A professor at the University of Texas in Dallas used Twitter to focus and streamline large-group discussion of small-group work on Fridays in a traditional, ninety-person, three-day-a-week introductory U.S. history class.[9] Two University of Minnesota instructors used various micro-blogging sites to deal with poor attendance and lack of student engagement in a film course on medieval cities of Europe.[10] The two Minnesota instructors saw promising results when they encouraged students to tweet—both extemporaneously and in response to specific questions—while watching films, and then used features such as a "tweet cloud" to stimulate post-film conversation. And these are just two examples of many from the humanities; one can keep abreast of many of the most up-to-date ideas about Twitter use and teaching just by searching the online journal, *Hybrid Pedagogy: A Digital Journal of Learning, Teaching, and Technology*, by following the journal's Twitter feed (@HybridPed), or by searching their Twitter hashtag (#digped).

While others have certainly begun to implement Twitter in their courses, the difference between previous use and what I was planning was marked in scale, evaluation, and context. In terms of scale, in Laurie Rowell's survey of experiments to "Capture the Backchannel," many educators had questioned the applicability and effectiveness of Twitter for classes exceeding 200 to 300 students in size—in other words, for courses only one-half to two-thirds the enrollment of the course I was teaching.[11] Few Twitter users in humanities courses had put in place any sort of instrument for measuring, directly or indirectly, the effectiveness of Twitter use in

their courses. Nor had many of the Twitter paedagogues, about whose experiments I had read, significantly considered the relationship between Twitter and the content they teach (in my case, the content was world history, and, in particular, an ongoing theme focused on the role of increased communication on pre-1500 C.E. human societies).[12]

My application of Twitter in the jumbo-sized lecture hall was not an example of a relatively new technology—social media—seeking an application, but rather of a pedagogical problem—disengaged students in the jumbo-sized world history course—seeking a solution. While there are other tech-savvy methods for attempting to facilitate the interactivity I sought, those tools had their problems as well. For instance, clickers—classroom response systems, such as those offered by eInstruction or i>clicker—are useful for concept checks and to take the pulse of the class, but from my own experience, I had found that the main drawbacks of such systems are that: 1) you can only ask a few questions in a fifty-minute time period, 2) the questions break the flow of lecture, 3) the questions can only be asked and entertained during class time, and 4) most importantly, the questions are structured by the professor, usually in advance (so again the direction/pace of critical thinking is framed by the professor, not by student need or interest). I had used clickers in the past, and continued to do so in Fall 2011, but I also wanted a mechanism for student-based/student-paced idea generation and critical engagement.

## Twitter in History 100

So how exactly was Twitter implemented in this jumbo-sized introductory world history course? After my initial considerations of the promise and potential pitfalls of Twitter as exemplified by the Arab Spring, the Weiner scandal and hacking threat, and other academics' experiments in using Twitter, the first step was to get on Twitter's site and set up an account. Setting up an account was quite simple in practice, but complex in terms of the potential ramifications of the account's specifications. In terms of the technical aspect of setting up an account, one need only go to Twitter's site (Twitter.com) and follow the "New to Twitter? Sign Up" link to begin the process. Probably the most difficult aspect of establishing the account was formulating a 140-character description for the persona of the course. More complex, however, was thinking about what I wanted the account to represent on Twitter: myself (the professor/expert), the topic (world history), or the class (History 100). I chose not to create a Twitter handle (account name) as myself, but rather as a personification of the class: I registered the account "sdsu_h100", with a profile/description reading: "400-student class, taught by E. A. Pollard (Fall 2011) exploring

**Figure 1**: Screenshot of the Twitter page for @sdsu_h100 in April 2012, including the 140-character description of the Twitter account's persona. Note that several months after the completion of the Fall semester, the class still maintained 120 followers. Such post-semester following suggests the possibility for ongoing student engagement with the ideas of the course. In Fall 2012, the second time I used Twitter in the course, the number of followers climbed to nearly 450, and remained at 360 in January 2013.

pre-1500 transregional connections facilitating the movement of peoples, goods, ideas, and germs." For the profile image, I selected a famous Babylonian map of the world dating to 700-500 B.C.E., held at the British Museum.[13] I made these choices because I did not want the students to think of the tweets as originating only from me (the lecture hall, e-mail, and Blackboard are certainly sufficient as a conduit of authoritative professor-speak), but rather from the course as a conglomerate with the capacity for collective learning (see Figure 1 for a screenshot of the account's profile page in April 2012).

After setting up the profile for @sdsu_h100, I was ready to begin tweeting, but first wanted to get my bearings in this world of micro-blogging. Twitter's "help" materials are actually quite user-friendly, with a well-organized "Twitter Basics" tutorial grouped into topics and FAQs, including information on "hashtags" (keywords marked in a tweet with the "#" character to facilitate easier searching for relevant topics on Twitter), "@replies" (tweets that are generated as replies to others that begin with "@username"), and "retweets" (tweets that are repeated or re-sent by users other than the original source, often spread to many recipients via "following"—an important feature of Twitter.). Twitter allows users to "follow" other users, with the follower receiving tweets from the followed. A user can follow others, have others follow them, and, of course, unfollow.

After perusing the help features and becoming conversant in Twitter-jargon, the next step for refining my persona was to select whom I followed. I wanted to use the Twitter feed for @sdsu_h100 in part as a way to disseminate links to get students more deeply invested in the course content, but also to maximize the collective learning potential of social networking by incorporating other tweets of interest (retweeting). I needed to locate and follow other feeds that would tweet the kinds of materials that would be relevant to my course. This was easily accomplished at Twitter's site by using the search window and perusing the Browse Categories offerings located under the #Discover button on my profile homepage, as well as by visiting the webpages of entities and organizations I thought might be useful and determining if they had a Twitter feed to follow. Since I anticipated being barraged each day with the tweets sent from every Twitter feed I followed, I wanted to be discriminating in my selection. I ultimately chose to follow sites that would send me information about primary source materials that would be relevant for world history (e.g., Library of Congress, British Museum), new finds relevant for changing our understandings of world history (e.g., *World Archaeology*, NE Asia Archaeology, and the Archaeological Institute of America), new arguments in world history or related fields (e.g., *History Today* and TED Talks), and the conversations relevant to the field of world history (e.g., the Big History Project).

The third step was to get followers (students on Twitter) and to begin tweeting. Acquiring followers amounted to including my Twitter handle (@sdsu_h100) on the course syllabus and Blackboard website and announcing on the first day of class that I would be using Twitter in the course as a way to contact students outside of class time with announcements and additional learning resources. Strikingly, within minutes of announcing my Twitter handle on the first day of class, I had

forty followers. By October, one month into the course, the number of students following my Twitter feed was 120, and maxed out towards the end of the Fall semester with 150 students (around 40% of the class).

Once @sdsu_h100 had followers, I began to tweet regularly with items of interest, drawn from my own following of various history-related Twitter feeds, movie clips from YouTube, and news items of relevance. Probably the trickiest aspect of tweeting, from the point of view of a professor (i.e., one who sees incredible complexity in every issue or student question) is to limit a tweet to 140 characters. The benefit of such a limitation, however, is that the professor needs to think carefully about what he/she is going to say and to say it simply and directly. Figure 2 offers a representative two-week period of tweets from September 2011. Note that the tweets attempt to draw from a wide range of media and to emphasize issues relevant to class at a given moment. Tweets included: a link to the Smithsonian's interactive Human Origins project (10 September) to buttress our in-class coverage of human ancestors; a TED Talk about Indus Valley Script (13 September) and a YouTube video of finds from the Royal Tomb of Ur (13 September), both to underline the nature of specialization within, and interaction between, earliest civilizations of Afro-Eurasia in the third and second millennia B.C.E.; a link to a history of the world through the objects online exhibition at the British Museum (19 September) to emphasize the nature of the historical evidence for the third and second millennia B.C.E.; and a scene from the 2006 blockbuster movie *300* (26 September), suggesting many themes, but particularly highlighting the role of the military in Persia's maintenance of its highly centralized empire in the mid-first millennium B.C.E. Note that only one of the tweets in this two-and-a-half-week period was of a "housekeeping" nature, reminding students, ironically, to register their clickers that we were using for in-class concept checks.

The final and perhaps most important step to implementing Twitter in the course was encouraging student tweets during lecture. At the start of class each day, I mentioned that I would be monitoring my Twitter handle for incoming questions and then stopping at various points in the lecture to solicit tweeted questions and comments. I would also encourage tweeting after they had answered a clicker-administered concept check. I answered some of the tweeted questions during class at the various moments when I would, in a smaller class, answer hand-raised questions; others I would answer via Twitter in the few minutes after class. Depending on the nature of the question (and its relevance for the class as a whole), I might retweet the question to all and then tweet my answer or respond with a direct tweet to the student. In terms of pacing, I might tweet on Sunday with some thoughts for the week, or on Thursday as a follow-up to the

**Figure 2:** Series of tweets sent by me via @sdsu_h100 in September 2011. Note the range of tweet types (links to videos, TED Talks, museum websites, classroom management, etc.). Note also retweeting of content tweeted by a graduate student teaching assistant (marked in the feed with an arrow in the upper right-hand corner of the tweet).

week's lectures. While I occasionally used Twitter for reminders about exams and paper due dates, I reserved such housekeeping primarily for e-mail, recognizing that only about 40% of the class was following the @sdsu_h100 handle.

In sum, Twitter use for the jumbo-sized world history class was a relatively low-investment, high-yield activity. With very little up-front effort, minimal ongoing (but creative) tweeting, regular checking and response to student tweets, and discretion in what I sent to students, I had the sense that I had achieved what I had hoped to accomplish: creating greater interactivity both in class and outside of class, and engaging the students more deeply in the content of world history, in a way that even emphasized one of the overall themes of world history—the impact of collective learning on human development. But was that just my impression, or could I document what I felt had happened?

## Findings

Three instruments allowed an assessment of the impact of Twitter on the jumbo-sized world history survey: 1) statistics for the @sdsu_h100 tweet handle, as measured on Tweetstats.com, 2) a survey of my students facilitated on SurveyMonkey, and 3) the regular, online student evaluations completed by a large percentage of the students in the course. Tweetstats. com allowed me to track the hourly, daily, monthly, and hence semesterly, rhythms of the Twitter use in the course. As far as time of day, the Tweetstats chart demonstrating aggregate hourly tweets for @sdsu_h100 (Figure 3) showed that tweeting was high especially at the beginning and end of class (which met 12:00-12:50 p.m.), but spiked in the 4:00 p.m. range and later in the evening (just after 8:00 p.m.). This suggests that, while Twitter was used during class sessions (or mid-day), as I had hoped, Twitter was also used by both students and me later in the day—after classes—to digest what had happened in class and even later into the evening (television primetime, when one would almost never imagine student engagement with course materials). A chart demonstrating aggregate daily tweets showed that tweet activity, perhaps not surprisingly, was highest mid-week (Wednesday) and second-highest on Monday, the days when the course met and when in-class questions were posed by students (as well as retweeted and answered by me). But noticeably, tweet activity was also relatively high on Sunday (the day prior to the first class meeting each week on Monday), almost equal to Thursday (the day after the second class meeting, presumably when the students and professor were completing weekly readings and preparing for Monday's class and Friday's break-out sections with TAs). Twitter activity occurred every day of the week, but was lowest on Friday
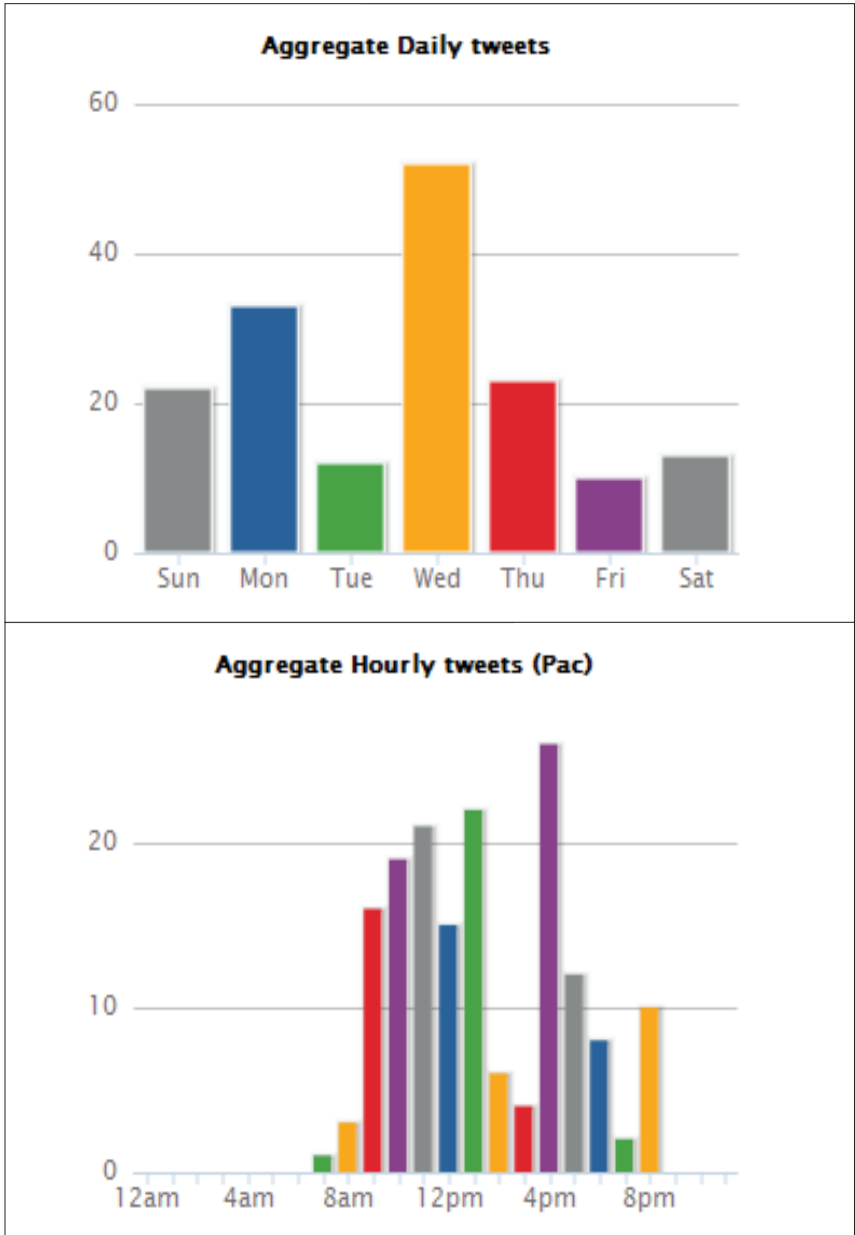
**Figure 3:** Tweetstats.com charts demonstrating daily and hourly tweet patterns for @sdsu_h100. Note weekly rhythms peaking on days of class meetings (Monday and Wednesday), but also the days before (Sunday) and days after (Thursday).
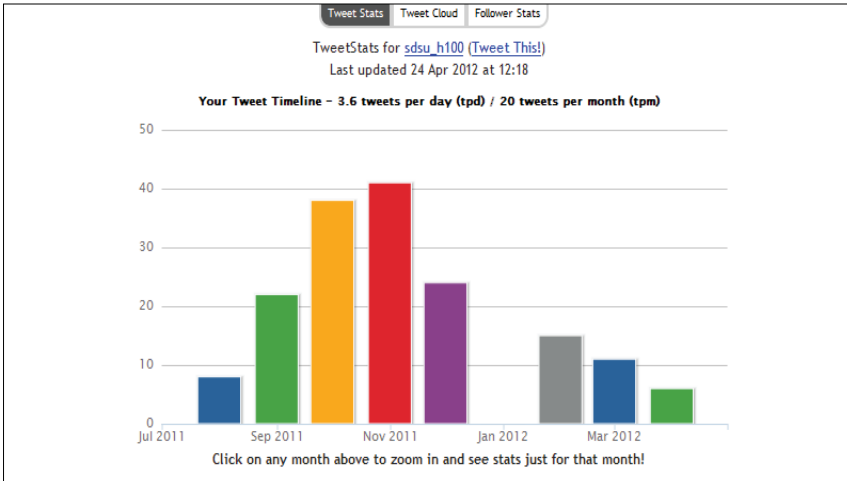
**Figure 4:** Tweetstats.com chart demonstrating the monthly tweet patterns for @sdsu_h100, with peak in November at the time when student (and professor) "buy-in" is greatest—and when high-stakes assignments, paper, and final exam, are either due or imminent.

and Tuesday (Figure 3). The tweet timeline across the Fall 2011 semester shows an average of 3.6 tweets per day and 20 tweets per month for the @sdsu_h100 handle, with a steady increase in activity from September through October, a peak in November (when papers were due and final exam was preparation beginning), and a drop-off in December back to September levels (Figure 4). Such activity corresponds with what one would expect in terms of student (and professor) engagement in a course, with gradual buy-in over the semester and a peak in the thirteen- to fifteen-week mark, when the student learning curve is escalating and assignments are coming due.

A tweet cloud offers a visual representation of the ideas tweeted. The tweet cloud for @sdsu_h100 highlights a number of the themes emphasized in the course, as well as lacunae needing attention (Figure 5). Sharing the course's tweet cloud with the class towards the end of the semester offers an opportunity to review some of the key themes of the course and to puzzle out why some words featured prominently and others less so. For @sdsu_h100, words such as "sources," "text," "book," and "article," all appearing somewhat prominently on the tweet cloud, highlight the course's emphasis on the building blocks for "doing" history. B.C.E., B.P., C.E., and various dates emphasize the chronological thinking that comprises one of the course's learning goals. "Human," "paleolithic," "Empire," "Mongol," and "plague" foreground various topics that are central to the
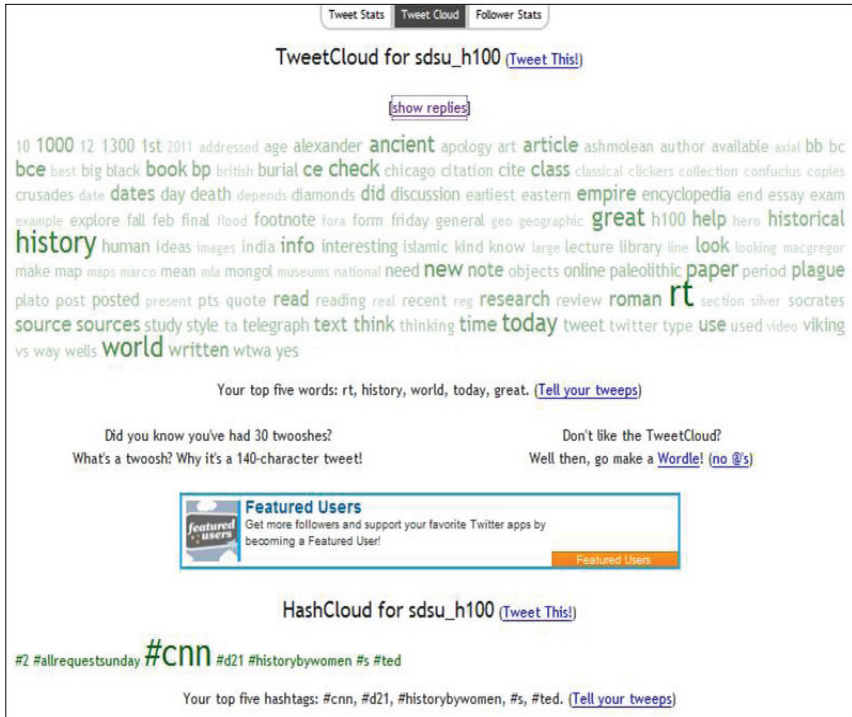
**Figure 5:** Tweetstats.com TweetCloud for @sdsu_h100. This cloud lists, in alphabetical order, words tweeted from the @sdsu_h100 feed. Words tweeted more frequently appear in larger font. Such a visual gives an opportunity at the end of the course to highlight central themes, approaches, and skills focused on by the course, as well as to reflect on lacunae needing attention.

pre-1500 C.E. world historical narrative. The tweet cloud can also serve as a useful check on lacunae, or topics under-emphasized, whether due to what is available for retweeting from the feeds followed and what is available on the Internet, or in response to student questions. For instance, while "Alexander," "Plato," and "Socrates" appear in the tweet cloud, no women by name, or even the word "gender," do—even though women's roles and gender relations in world history are ongoing themes in the course that are integrated into nearly every lecture. Similarly, while the course emphasized the whole of the pre-1500 C.E. global narrative, western (or at least European) topics appear to have featured more prominently on Twitter than Asian, African, or American topics. The glaring absence of the themes one actually attempted to address (in my case, gender and non-European coverage) can spur the professor to find ways to make sure that

| Questions Regarding<br>**Access and Willingness to Participate** | Yes | No |
|---|---|---|
| 1. Did you have a Twitter account prior to the first day of H100? (If you answer "Yes" to this question, please continue on to question #4 without answering #2 and #3.) | 31% | 69% |
| 2. If you responded "No" to question #1, did you create a Twitter account for the purpose of accessing the H100 content on Twitter? (If you answer "Yes" to this question, please continue on to question #4, without answering #3.) | 51% | 49% |
| 3. If you responded "No" to questions #1 AND #2 (in other words, you did not have an account and did not create one), did you ever look at the Twitter content for H100? (If you answer "No" to this question—in other words, you had no Twitter account and never looked at the tweets for H100—please offer a comment here and then skip to question #10.) | 62% | 38% |

**Figure 6:** Table with results for student responses to survey questions 1-3, gauging student access to Twitter and their willingness to participate in H100 via micro-blogging.

underemphasized topics get better attention the next time around, perhaps by finding other feeds to follow that would generate content relevant to apparently neglected themes, by ensuring that the 140-character tweets contain keywords that echo all important themes, and by being more intentional about seeking out content related to themes under-represented on the @sdsu_h100 Twitter feed.

Apart from analyzing tweet stats, an optional post-class survey, administered via SurveyMonkey, garnered frank and anonymous input from students who had finished the course. The survey consisted of ten questions, intended to determine whether or not students had actually taken advantage of the course's Twitter component, and with what results. Of the 370 students registered for the course, 81 students responded to the survey; a pretty good response rate for an optional, post-semester task sent to students via e-mail and Twitter (after exams, after grades). As with all such optional surveys, however, it is useful to temper the results with the knowledge that one is likely to get the most motivated students responding—either those who had a particularly good or a particularly bad experience.

The first three questions were intended to gauge student "buy-in" to the Twitter use in the class (see Figure 6 for the wording of the questions and the student responses). Given what faculty have come to expect from what is often described as a thoroughly networked generation, only 31%

| Questions Regarding Type and Frequency of Twitter Interaction | Always | Often | Some-times | Never |
|---|---|---|---|---|
| 4. How often did you take a look at the Twitter feed for H100? | 7% | 22% | 39% | 32% |
| 5. How often did you follow the links to articles embedded in H100 tweets? | 5% | 21% | 38% | 36% |
| 6. How often did you follow links to video content embedded in the H100 tweets? | 4% | 16% | 47% | 33% |
| 7. How often did you tweet to the H100 Twitter handle (@sdsu_h100)? | (5+) 4% | (3-5) 5% | (1-3) 30% | (0) 61% |
| 8. If you tweeted to @sdsu_h100, what kind of comment did you tweet? (Please check all that apply.) | Re: Lecture 37.5% | Re: Course 34.5% | Re: Assigns. 47% | Re: Other 25% |
| 9. How useful was the H100 twitter feed in helping you to understand better what was going on in the class as a whole (either with lecture content OR assignments)? | Incredibly 18% | Somewhat 67% | | Useless 15% |

**Figure 7:** Table with results for student responses to questions 4-9, gauging type and frequency of student use of Twitter. Percentages for questions 4-9 are likely skewed lower, as N ranged from 70-74 respondents; N should have been 69, since 12 students in question 3 admitted to never having used Twitter (these non-users likely answered with "never").

of the students responding to the survey reported that they had a Twitter account prior to the beginning of the course. When asked whether or not they then went on to create an account in order to access the Twitter content for the course, just over half (51%) said they did. And of the students who said they neither had an account nor created one, 38% never felt the need to look at the Twitter content (i.e., presumably about 15% of the class, if the sample who participated in the survey can be projected onto the whole). The small percentage of the class that never participated in the class via Twitter, either by creating an account or even looking at the Twitter account for the class, offered various reasons for their disengagement. For some, resisting creating a Twitter account was the result of not particularly enjoying the course material of what was, after all, a jumbo-sized general education requirement course: "I was very uninterested in the subject matter," wrote one respondent. For others, they did not perceive that Twitter was offering anything vital to their learning: "[a]ll of the questions that I had were answered via email" and "for me the large class presentation and small class presentations were enough," wrote

two students who never created an account nor looked at the Twitter feed for the class. Perhaps most surprising, though, were the students who *on principle* did not create a Twitter account and access the Twitter materials for the course. Along these lines, a few students offered responses such as: "I did not want to create an account," "I don't like social networking sites," and most elaborately:

> I don't like to follow the rest of the pack and I don't jump on the bandwagon for almost any reason. The fact that this class tried to pressure me into using twitter turned me off to the idea. What is so special about twitter that makes it better than other more conventional methods of communication? None of my other classes use twitter and I got on just fine in those so I was pretty unwilling to go on twitter.

Apart from the questions geared to understanding student "buy-in," the survey also posed questions intended to explore the way that students who *did* participate in Twitter experienced the micro-blogging component of the course (see Figure 7 for questions and responses). Of students who had a Twitter account, whether pre-existing or created just for the course, 61% reported that they "often" or "sometimes" looked at the @sdsu_h100 Twitter feed, with another 7% saying they checked it "all the time." To determine whether or not students were active or passive followers of @sdsu_h100, the survey queried whether or not students followed the links to articles and video, with results being about the same: 59% of students who followed the Twitter feed "often" or "sometimes" (and another 5% "always") followed the links tweeted by me to various articles (ranging from scholarly to popular news media) and 63% "often" or "sometimes" (and another 4% "always") checked the tweeted links to videos (ranging from relatively erudite TED Talks to popular big-budget productions with snippets on YouTube). Another series of questions explored students' @sdsu_h100-related tweeting, asking them their perception of the frequency with which they tweeted and the kinds of issues about which they tweeted: 39% of students reported tweeting at some point during the course (4% tweeting more than five times, 5% tweeting three to five times, and 30% tweeting one to three times); 61% never tweeted at all. While at first that might seem like a failure, just think of the number of good students who never ask questions or speak out in class, even when prodded to do so. When asked what kinds of tweets they tweeted to @sdsu_h100 (and allowed to select all that applied), 37.5% tweeted about lecture, 34.5% tweeted about the ideas of the course in general, 47% tweeted questions about assignments, and 25% tweeted about other issues.

When asked "How useful was the H100 twitter feed in helping you to understand better what was going on in the class as a whole (either with lecture content OR assignments)?", 18% answered "incredibly" and

another 67% answered "somewhat," with the relatively small remainder of 15% answering "useless." A final free-response survey question asking for their general thoughts on Twitter offered a few highlights for student perception of how Twitter had impacted their experience of the jumbo-sized lecture. One student experienced Twitter as addressing exactly the issue I had initially hoped to address—namely, the size and consequent anonymity of the jumbo-sized class: "using twitter was a good idea since the class was HUGE." Another student picked up on the heightened engagement, commenting that "the use of twitter was very creative and an instant/almost live way to stay connected in what was going on in the class." One student saw the value in Twitter for maintaining the flow of lecture and for pre-selecting questions: "It allowed little to no stops in lectures allowing you to cover more material in depth and when there were questions you would be able to weed out the good ones and not be forced to answer not so good ones that may be answered in the next slide." And finally, another student—interestingly, one who saw his/her direct involvement in Twitter as minimal—summed up his/her experience in words that underlined the hoped-for outcome: "I really loved the use of twitter. Personally, I never used it, but I liked that we were given the opportunity to have our questions answered during lecture. Professors don't always allow people to raise their hands (especially in large lectures) because it can get too hectic. I feel like twitter solves this problem."

The results of the SurveyMonkey instrument in which 81 students participated are confirmed and even strengthened, both quantitatively and qualitatively, by the results from the standardized, end-of-term, online student evaluations completed in Fall 2011 by 81% of the students enrolled in the course (N=301 of 370). Strikingly, in the questions that may have been impacted by Twitter use in the class, the numbers for Fall 2011 show what a pollster might call a "Twitter-bump" of 0.2 (on a 5-point scale). All other aspects in my teaching of the course being relatively equal (jumbo-sized with TA-led break-out sections, supplementary use of Blackboard and clickers, similar assignments, same textbook, etc.), student evaluation of my performance rose in response to questions that may have been impacted by my Twitter use. While the mean in response to "instructor was knowledgeable about his or her field of history" had been level at 4.62 in 2009 and 4.60 in 2010, when I was using Twitter to entertain questions and maximize collective learning by tapping students into a wealth of supplementary resources, student response on instructor's knowledge jumped to 4.81 in Fall 2011. Student response to the question about "variety of teaching methods (such as lectures, group discussions, presentations, or internet)" predictably jumped from 4.04 in 2009 and 4.13 in 2010, to 4.32 in 2011. When asked whether "the course helped

[the student] to read and understand historical sources," 4.20 (2009) and 4.16 (2010) jumped to 4.38 (2011). While in earlier semesters of the class, students' response to the question "instructor encouraged me to think, ask questions, and express my views" had garnered a mean of 4.11 (2009) and 4.02 (2010), in Fall 2011 with Twitter used to entertain student queries, the student mean response was 4.29—in a 370-person class! While the teaching evaluation numbers may not seem particularly high, they are actually quite good for a jumbo-sized class in which a huge number of students never feel a personal connection with the instructor and consequently feel liberated to "flame" the professor in evaluations for issues often beyond his or her control. Regardless, in these quantitative rankings by students concerning possibly Twitter-impacted categories (instructor knowledge, understanding of source material, variety of teaching methods, and student expression), areas of teaching where I might have plateaued were raised to another level.

Qualitative feedback on the standardized student evaluation form offered additional commentary on students' perception of Twitter's impact on their learning. Negative commentary about Twitter use in the class centered on one primary concern: students feeling like they would have preferred to ask questions via hand-raising. Only a couple of students commented that they felt that they were silenced if they had neither a laptop nor wireless device in class; in fact, the vast majority of students *do* have handheld, or other portable, Internet access (and if they do not, the student sitting next to them likely does). Yet students who complained about not being able to ask questions without Internet access do not seem to realize (and perhaps I will be clearer about this in future semesters) is that the alternative to the backchannel in the jumbo-sized lecture hall with two fifty-minute lectures a week is not hand-raising, but no questions at all. Despite some students wishing that they could have asked questions in the traditional way, students singling out Twitter as an aspect "your instructor in this course has done well and that you especially liked" outnumbered by nearly four to one the students who mentioned some aspect of Twitter as one of "the ways in which you think this course and your instructor's teaching might be improved," even though the standardized evaluation itself asked nothing about Twitter specifically. Positive comments about Twitter ranged from the indirect ("she was always open to answering questions during and after class, while providing additional information on subjects continually," "instructor personally interested me in the subject to where I went out and further[ed] my studies on my own," and "my instructor was very helpful outside of the classroom") to the direct ("I constantly asked questions using twitter and even wanted to discuss more about a topic that she had only 50 minutes to teach," "nothing was boring and the twitter site made it awesome," and "I

liked that she utilized social media with Twitter. It felt to me that she was trying to relate to her students and I really appreciated that.").

## Pros and Cons of Twitter Use in the Jumbo-Sized Course

The most significant con of my Twitter use in the jumbo-sized world history classroom was that not all students followed the @sdsu_h100 Twitter feed—in fact only 40% did. Given this disengagement by some students in the Twitter aspect of the class, I could not rely upon tweeting as a way to reach all 370 students with particular ideas. But then again, who are we kidding if we think lecture or textbook readings are a common ground for all the students and us? I would sadly, but realistically, win a wager that more students avoided reading (or even purchasing) the book assigned for the course than boycotted Twitter. You can assign a textbook, and even base a certain amount of high-stakes assessment on those readings, and you will always have a number of students who do not read and do not even purchase the text. Similarly, you can expect that certain students, for whatever reason, will reject a technological innovation. You can lead a student to Twitter, but you cannot make them tweet!

The other con of Twitter use in the jumbo-sized lecture—possible student distraction—was far outweighed by the related pros. The most obvious pro: *the backchannel was definitely opened*. Students were asking questions—good ones—*during* the lecture, without breaking the flow of course content. This channel for good questioning created a more interactive learning environment for all. Even if students did not pose questions themselves, they knew that questions were being asked by students and answered by the professor in "real-time," and deeper learning resulted, especially for those who invested in Twitter. Next, Twitter use in the jumbo-sized lecture *focused student use of whatever digital/handheld device the student had in the lecture hall*. The trade-off for the possibility that students would receive unrelated tweets (entertainment-based or personal) during class is that the professor can "interrupt" the students' weekend (Thursday through Sunday!) with a history-related tweet. Those who followed the Twitter feed for the class got *quicker access to me (and I to them) than is possible with Blackboard and e-mail*. In fact, I guaranteed students that they would receive information related to the class first via Twitter and then via a follow-up on e-mail and Blackboard announcement. Such a scenario played out unexpectedly when, on Thursday, September 8, 2011, a massive power outage impacted Southern California, leaving millions without electricity (and so, access to computers and, in many cases, the traditional ways we contact students via Blackboard and e-mail).[14] Given it was only the second week of the semester, students were

confused about whether their break-out sections with TAs would meet the following day.  Twitter offered me a way to contact those students who had followed my Twitter feed, provided their cell phones were charged and they still had connectivity.

Most importantly, though, what some perceive as a weakness of Twitter I found to be perhaps its greatest strength—namely, the 140-character limit for a tweet. *The strict 140-character limit encouraged succinct student inquiry and succinct professor response.*  Students needed to decide what exactly their question was before posing it, given the limited characters in which the question had to be framed.  This meant that instead of asking random, ill-conceived questions, students had to think about what they wanted to ask, which meant they were thinking about the lecture.  Inchoate questions were still possible (and welcome), but fundamentally ill-framed queries become less frequent.  Succinct student inquiry was matched, as noted earlier, by succinct professor response via Twitter.  Instead of offering rambling and indirect answers framed on e-mail or during class with great cost to time and little payoff (especially when students mentally check-out even when the most essential question is being answering in an integrated way), professors can achieve high-yield results by framing 140-character tweets that directly answer a question and even draw on other resources (websites, videos, etc.) as follow-up should the student desire to explore an answer in greater depth.

## Best Practices

As a result of this experiment with using Twitter in the jumbo-sized world history course, I would offer the following suggestions for "best practices":

**1) *Tweet regularly and only with useful/relevant materials, but not so often that you become "noise" on their feeds.*** Regular tweeting—a few times a week—ensures that your voice becomes a regular appearance on students' Twitter accounts and that Twitter is seen by the students to be an integral part of their learning in the course (not an occasional add-on).  Regular tweets might serve as follow-ups to classroom questions or conversation not completed in the regular meeting time; or, conversely, a tweet over the weekend might offer an opportunity to engage students with a central idea prior to attending class.  Important, though, is to keep the tweets to a relative minimum and to avoid using Twitter essentially to nag your students about assignments and due dates.  Use Twitter to engage students in the kind of deep, critical thinking you hope to inspire, not to harangue them into compliance with course expectations.

**2)** ***Select carefully what you follow, to set an example and to reduce "noise" on your own feed.*** Set an example for students through the feeds you follow with your academic persona. The feeds you follow will offer useful material for retweets, but more importantly, will encourage among students a sense of what information and conversation, valuable for their engagement of the course content, is accessible via Twitter feeds. Limiting the number of feeds followed also makes it easier for the instructor to sift through the incoming information and not to miss the ideas of students in the tweets of the other feeds followed. Selective following and sifting through tweets, if done in a way transparent to students, also sets an example for how to weigh various source materials when exploring history.

**3)** ***Encourage students to tweet at several points in the lecture—and stop to respond to tweets at set points in the lecture.*** In the same way that you might, in a smaller course, stop to entertain questions, stop lecturing and ask for tweeted questions from the students. This momentary pause will give you a chance to peruse any questions tweeted while you were lecturing and will remind students to use Twitter to pose their queries. Additionally, addressing tweets with answers during the large lecture reinforces for students the value of posing their questions via this medium.

**4)** ***Know your content hands-down and avoid being derailed by incoming tweets.*** As when incorporating any technology into teaching, one should not do so until comfortable with low-tech teaching of the course. New technologies pose new problems in classroom management, no matter how prepared one is to deal with them, so it is essential that the instructor be able to go on autopilot with course content while seamlessly addressing any technological hurdle that might arise. Additionally, avoid allowing Twitter to become a distraction for you or the students. Think of tweets during class as raised hands, and deal with them accordingly. Just as you would not stop lecture to address every question every time a hand went up, wait to address tweets knowing that some questions will be answered in the way you complete your coverage of an issue and that other questions can, and should, wait for answering.

## Twitter Revisions

Apart from these so-called "best practices," some of which have been hard-learned by negative example (i.e., I did the opposite, to poor effect and negative response), my experience with Twitter in Fall 2011 also encouraged me to formulate some revisions in how I use this particular social medium in my course in the future.

Twitter use is demonstrably on the rise among college-aged students. The "Twitter Use 2012" study, run by Aaron Smith and Joanna Brenner out of the Pew Research Center's Internet & American Life Project, found that while "Twitter use within the overall population remained steady over the last year…[t]he youngest adults (those between the ages of 18 and 24) are the primary exception to this trend—nearly one-third of internet users in this age group now use Twitter, up from 18% in May of 2011 and 16% in late 2010."[15]  The Pew study goes on to note that "[f]ully one in five internet users ages 18-24 (20%) now use Twitter on a typical day, up from 9% in May 2011."  The researchers give credit for this dramatic increase in Twitter use among the 18-24 age group to the fact that this demographic simultaneously experienced the "largest increase in smartphone ownership of any demographic group over the same time period."[16]  This Pew study, then, suggests that Twitter is a good location, getting even better, for reaching our students outside the classroom.

Given the growing popularity of Twitter among college-aged students, it seems reasonable to continue in future semesters to adapt this experiment with Tweeting on the backchannel.  One revision I will be implementing is developing hashtags for central topics over the course of the semester, including them on the syllabus, and sharing those hashtags with professors and experts at other institutions in the hopes of coordinating outside participation on the issues under discussion in H100 at SDSU.  Hashtagging (marking a term or phrase with a "#" symbol) allows for easier searching by students and others to see what is trending in our class or with the topic at large. [17]  If I want to create a largely insular conversation about a particular topic, I can create a hashtag that is unusual and likely to be class-specific; for example, "#agrev" for the agricultural revolution.  Such a hashtag would allow students to search easily and more successfully for any tweets posted by me or others in the course the week we are discussing the agricultural revolution, but would be unlikely to generate a lot of "noise" (i.e., irrelevant tweets) in the search feature.  If I wanted to open up the conversation to a wider audience and context, I might also include hashtags more commonly used by the public, such as #humans&environment or #sustainable.  Remember that the shorter the hashtag, the better, since its length counts in the 140-character tweet limit, and that it is best to keep the symbols to a minimum, since they are more challenging to input on a handheld mobile device).  Other hashtags already in existence that might bring the students into an already thriving conversation include #silkroad and #alexanderthegreat (the weeks we are discussing early globalization) or #climatechange (several times over the course of the semester, when discussing the role of climate change in historical developments).  However, I would avoid hashtags like #blackdeath or #ottoman, as they are glutted

with Twitter commentary on the like-named 2010 Sean Bean movie and type of furniture, respectively. Incorporating hashtags takes a bit of upfront investigation and creativity—brainstorming and test-searching possible catch-phrases, finding terms with appropriate character length (not too long nor too easy to misspell) and appropriate overlap with conversations that offer good intersections and opportunities for students to think outside the box of the classroom's way of defining an issue.

Other possible revisions include projecting, on a screen separate from the one on which I am projecting the course content, a TweetDeck that streamlines real-time student questioning for all to see. That way, students can respond to others' questions, echoing their desire to have an issue addressed and creating more interactivity amongst the group. Additionally, in my desire to ramp-up student involvement, I intend to incorporate Twitter involvement into students' participation grade for the course (already measured with near-daily concept checks via i>clicker). Students will be required to create a Twitter account if they do not already have one, follow the class's feed, and ask substantive and meaningful questions a certain number of times over the course of the semester. While I had promoted only optional participation in Twitter while piloting the project, my experiments in Twitter pedagogy have suggested that Twitter is useful enough to warrant more thorough incorporation into the course.

## Twitter and Skills/Content Goals of an Introductory History Course

What is the "usefulness" of Twitter for thinking about and doing history? As a medium of human communication, Twitter is particularly useful to historians, perhaps counter-intuitively, even historians of pre-1500 C.E. attempting to teach students how to "do" history, especially how to work with sources and how to track developments in historiography. First, there is the possibility of teaching students to think of Twitter itself as a historical source, and what that can tell us about the nature of the sources we use to construct history. Thanks to the transfer of public tweets to the digital archive of the Library of Congress, Twitter will be a valuable primary source for future scholars trying to understand what people—or at least a certain group of people—were thinking about in the early third millennium C.E. and how they shared those ideas.[18] In essence, Twitter is the aether-trashheap through which future cyber-archaeologists will sift in order to gauge the values of our society from a particular perspective. A reality check for students and historians alike, grappling with the incomplete historical record of the pre-modern world, but trying to understand the values of subaltern groups (as opposed to high-status, political elites) is the "Year in Review" posted by Twitter, in which the site itemizes the most

popular trending topics and the issues that generated the highest number of tweets per second (tps).  In a year that saw the toppling of totalitarian regimes across the Middle East and North Africa; a massive earthquake, tsunami, and subsequent nuclear disaster in Japan; and the death of Osama bin Laden, #egypt was the most popular hashtag, followed in second place by #tigerblood (with reference to actor Charlie Sheen's very public implosion).[19]  Developments in soccer (7,166 tps for Brazil's elimination from the Copa America on July 17) and the resignation and death of Steve Jobs (7,064 tps on August 26 and 6,049 tps on October 6) generated more tps than the raid on Osama bin Laden's compound in Pakistan or the Japanese earthquake and tsunami (5,106 tps on May 1 and 5,530 tps on March 11, respectively); in fact the highest tps figure was associated with the MTV Video Music Awards on August 28 (8,868 tps).[20]  All of those statistics offer valuable insight into the kinds of issues that are tweeted and who is likely doing the tweeting.  Apart from using Twitter to think about the nature of source material, tweeting news coverage of history-related stories prompts students to think about pre-modern history as a living field, one that is always changing with new finds and new interpretations, even making headlines—in other words, a field characterized by active and exciting historiography.  For example, paleoanthropologists are always grabbing headlines with reports of a new human ancestor, and approaches to world history can be crafted to highlight connections to the present and even to topics trending on Twitter, such as the elsewhere-mentioned #sustainable or #humans&environment.  Twitter's usefulness for history-related learning outcomes, such as working with primary sources and understanding historiography, is ripe with possibility.

   Apart from these skill-related goals, using social media such as Twitter overlaps with the content goals of an early world history course in which students learn about how innovations in communication have shaped global history.  In the pre-1500 C.E. course, students learn about the role of communication in the facilitation of collective learning among early hominins and the impact that had on human development from *Homo erectus* as compared with *Homo sapiens* more than 150,000 years ago.  Collective learning, as David Christian has described in his *Maps of Time*, is that process, made possible initially by human language, by which "knowledge and skills can accumulate non-genetically from generation to generation, and each individual has access to the stored knowledge of many previous generations…ensur[ing] that humans as a species will get better at extracting resources from the environment," leading to the increase of human populations.[21]  Students learn about the development of writing in early civilizations around 3000 B.C.E.—the cuneiform of Mesopotamia and the hieroglyphs of the Egyptians that occurred within

one hundred years of one another—and how that writing was connected to developments in labor specialization, social stratification, religion, and commerce.  Students glimpse the ever-widening information networks made possible by the earliest globalizing connections of Afro-Eurasia in the first millennium B.C.E.  And students learn the impact of moveable type in eleventh-century China and mid-fifteenth-century Europe.  Such innovations in communication, fast-forward to the present day with social media sites such as Twitter, demonstrate the power of collective learning as an ongoing historical force for change.

To return to one of the messages of the Arab Spring of 2011, commentators have noted that governments that feel threatened by social networking sites should spend less time censoring posts hostile to their power and more time "reading those posts and figuring out how to identify and address the legitimate grievances that are being expressed there…[u]sing surveillance to stay in power not by thwarting people, but by serving them."[22]  The old model of an asynchronous dialogue via a learning management system such as Blackboard or WebCT and monitored by the faculty member always on the lookout for student misuse of the fora is the pedagogical parallel to those totalitarian regimes whose Internet filters create a parallel universe of controlled, and even closed, information and conversation.  Twitter use, both structured/elicited and extemporaneous, can stimulate deeper student engagement for those who participate and can offer a modern-day parallel for one of the most important ongoing developments in world history, both pre- and post-1500 C.E.—namely, the increase in collective learning potential of humans via advances in communication.

## Notes

2.      On the relationship between Twitter and the media's reporting of the Arab Spring, see Zizi Papacharissi and Maria de Fatima Oliveira, "Affective News and Networked Publics: The Rhythms of News Storytelling on #Egypt" *Journal of Communication* 62, no. 2 (2012): 266-282 [n.b. Papacharissi and Oliveira's essay appears in a special issue of the *Journal of Communication* dedicated to the role of social media in political change].

3.      William Saletan, "Springtime for Twitter: Is the Internet Driving the Revolutions of the Arab Spring?" Slate.com, 18 July 2011, <http://www.slate.com/articles/technology/

future_tense/2011/07/springtime_for_twitter.html>. Since the initial excitement and fervor of the revolution, many academic studies have begun to appear about the role of social media in the Arab Spring, including: Papacharissi and Oliviera (above, from the University of Illinois at Chicago), and (from the University of Washington) Philip N. Howard, Aiden Duffey, Deen Freelon, Muzammil Hussain, Will Mari, and Marwa Mazaid, "Opening Closed Regimes: What Was the Role of Social Media During the Arab Spring?" a working paper from the Project on Information Technology & Political Islam, <http://dl.dropbox. com/u/12947477/publications/2011_Howard-Duffy-Freelon-Hussain-Mari-Mazaid_pITPI. pdf>, which drew attention to the way social media such as Twitter shaped the debates, preceded actual events "on the ground," allowed international participation, and allowed for women's heightened involvement in the revolutionary conversations.

4.     For example, "Rep. Weiner: I did not send Twitter crotch pic," CBSNews.com, 29 May 2011, <http://www.cbsnews.com/stories/2011/05/29/politics/main20067242. shtml>.

5.     Gennette Cordova, "Statement from Gennette Cordova, Student who was Sent Lewd Twitter Photo from Rep. Weiner's Account," *New York Daily News*, 29 May 2011, <http://www.nydailynews.com/new-york/statement-gennette-cordova-student-lewd-twitter-photo-rep-weiner-account-article-1.140477#ixzz2xoPYh6fS>.

6.     Dan Riehl, "Rep. Weiner Spokesperson Lies To 'New York Post'," Breitbart. com, 28 May 2011, <http://www.breitbart.com/Big-Journalism/2011/05/28/Rep-Weiner-Spokesperson-Lies-To-New-York-Post>.

7.     Alison Gendar, "Rep. Anthony Weiner Snaps at Reporter Asking about Lewd Picture that Came from his Twitter Feed," *New York Daily News*, 31 May 2011, <http:// articles.nydailynews.com/2011-05-31/news/29627419_1_twitter-account-twitter-feed-twitter-followers>.

8.     Brian Browdie, "FBI Joins Search for NBC News Twitter Hackers; The Script Kiddies Group Claimed Responsibility," *New York Daily News*, 10 September 2011, <http://articles.nydailynews.com/2011-09-10/news/30162481_1_twitter-account-twitter-feed-tweets>.

9.     Monica Rankin, "Some General Comments on the 'Twitter Experiment,'" faculty page, n.d., <http://www.utdallas.edu/~mrankin/usweb/twitterconclusions.htm>.

10.     Jude Higdon, Kathryn Reyerson, Colin McFadden, and Kevin Mummey, "Twitter, Wordle, and ChimeIn as Student Response Pedagogies," *EDUCAUSE Quarterly* 34, no. 1 (2011), <http://www.educause.edu/ero/article/twitter-wordle-and-chimein-student-response-pedagogies>.

11.     Laurie Rowell, "Capture the Backchannel," *eLearn Magazine: Education and Technology in Perspective* (August 2009), <http://elearnmag.acm.org/archive. cfm?aid=1597010> reviews several educators' experiences with using Twitter and other Live Question Tools to open a backchannel, but the educators interviewed questioned the applicability and effectiveness of Twitter for classes exceeding 200 to 300 in size.

12.     A notable exception at my home institution was my colleague Kurt Lindemann, who was developing his use of Twitter in his introductory jumbo-sized Communications 103 course at the same time I was working on the use of Twitter in my History 100 class, although the integration of content (communications) with medium (social networking sites) is perhaps much more obvious in a communications course.

13.     For details about this object (from Iraq and catalogued at the British Museum as ME 92687), see the British Museum's <http://www.britishmuseum.org/explore/highlights/ highlight_objects/me/m/map_of_the_world.aspx>.

14.     Craig Gustafson, "Unprecedented Outage Left Millions in the Dark," *San Diego Union Tribune*, 8 September 2011, <http://www.utsandiego.com/news/2011/sep/08/ widespread-power-outages-across-san-diego-county/>.

15.    Aaron Smith and Joanna Brenner, "Twitter Use 2012," *Pew Internet & American Life Project*, 31 May 2012, p. 4, <http://pewinternet.org/Reports/2012/Twitter-Use-2012.aspx>.

16.    Ibid., 5.

17.    For further discussion of "semiology and phenomenology of hashtaggery," see Susan Orlean, "Hash," *The New Yorker*, 29 June 2010, <http://www.newyorker.com/online/blogs/susanorlean/2010/06/hash.html>.

18.    Graeme McMillan, "Tweet Eternal: Pros and Cons of the Library of Congress Twitter Archive," *Time*, 8 December 2011, <http://techland.time.com/2011/12/08/tweet-eternal-pros-and-cons-of-the-library-of-congress-twitter-archive/#ixzz1yr94Etgz>.

19.    See Twitter's "Year in Review: Hot Topics" at <http://yearinreview.twitter.com/en/hottopics.html> for these Twitter stats, broken into categories such as television, movies, music, hashtags, and world news, to name a few.

20.    See Twitter's "Year in Review: Tweets per Second" at <http://yearinreview.twitter.com/en/tps.html> for tallies of the topics generating the highest numbers of tweets per second (tps).

21.    David Christian, *Maps of Time* (Los Angeles, CA: University of California Press, 2004), 146-147.

22.    Saletan.