Mobile Multi-modal Learning Facilitated through Twitter
A Case Study of Twitter Phenomenology with Graduate Level Nurses

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Abstract: Adapting academic course content to a mobile world continues to evolve as technology changes. A conceptual deployment of Twitter in a graduate level nursing informatics course is discussed along with how tweeting may fit learning styles, human working memory capacity and reduce the reliance on content management systems to facilitate an online course. Mechanisms for using Twitter to deliver course content and pollinate student interaction while maintaining private individual Twitter accounts for the faculty member and students are discussed.

1 INTRODUCTION

Few would argue that innovative technology and the pervasiveness of information tools into everyday life have changed the speed and flow of communication. Any broadcast message on a social media mechanism will likely receive some form of human feedback within seconds – from anywhere in the world. This availability of 'free' global information has changed our behaviors in accessing information and is influencing a change in the ways in which we learn. We still use our brain, eyes, ears, and written word but our attention span, vocabulary, and tolerance for the mundane hasdecreased in every aspect.

Over the last few yearsin my role as an assistant professor, I have been trying to be an innovator, however, I have come to realize that nothing is ever 'new' and that I will never be first with the idea. My strengths lie in: a) being aware, testing and trying the new tools; b) application of ideas in an educational context; and c)sharing my innovative concepts of repurposing the existing tools through written word.

2 BACKGROUND

Classroom content management systems (CMSs) have ruled the domain of online learning over the past few years as the popular tool to use when teaching online. But the reality is that the CMSs do not teach, they simply assist users in organizing content while requiring significant networkbandwidth and multiple navigationclicks for the users, i.e. extensive user time. They hold information placed in the provided structured network interface. The teaching aspect of online learning is mostly self-led while instructors moderate student discussion boards and grade assignments. After moderating multiple sessions of an online course, this instructor has encountered boredom with the CMS tool and the students have expressed disdain for the online discussion. To recapture interaction with students and interest in the course, change in the facilitation of the course must occur.

Social media tools such as Facebook, Twitter, LinkedIn and communication technologies such as short message service (SMS), Instagram, and Flipboard have revolutionized the way the world interacts. Employing these technologies into an online class may have the ability to unite the students into an online learning network resource group and make their course work and learning a

daily dynamic in their life routine.Not only would they have a 'cool' way to learn and communicate, they could become first adopters of the technology in their respective peer groups. However, using all of these tools in one course would overwhelm the student as well as the instructor. Moderation is required. After thoughtful deliberation and experimentation, Twitter was selected as the most appropriate learning tool for the current proposed intervention.

Twitter is a tool that limits communication to 140 characters. One could say, 'chunk of information' if making a comparison to Miller's 1956 Chunking Theory (Miller, 1956). This chunk of information would be considered a tweet from theTwitter software. Miller proposed that individualshave the ability to retain 7 numbers, plus or minus 2, in their working memory. While comparing 7 digits with or without ±2 digits to 140 characters is quite different, there are knownmemory advantages for the characters. The 140 characters create words that hold the potential to tell stories. Storytelling is a praised teaching methodology known to stimulate student interest and increase information recall (McKee and Fryer, 2003, Dewey, 1933).

Within the story told by a tweet the use of the hashtag incorporates a symbol. Saloman found that symbols have the ability to reduce the mental load and processing power, increase the quantity of the message being delivered and ease recall in individuals (Saloman, 1979).

Symbols can also be referred to as pictures, graphics, and include color to depict a message in Twitter to build a tweet. With the inclusion of pictures and symbols in a tweet, Twitter software actually increases the quantity of information transmitted in only a 140 characters. The adage of, 'A picture is worth a thousand words' is further strengthened with research findings. The viewing of pictures creates a memory representation that conceptualizes as information(Loftus et al., 1985, Whitley, 2013). Pictures, symbols and colors can be combined to create an infographic that tells a story (Krauss, 2012). The information represented as an image causes the brain to look at the information from more than one angle which often assists the brain in faster absorption of the information (Davison, 2009, Zhang, 2012).

By using Twitter, as a mobile learning technology, learning in the real world context is suddenly available. When receiving 140 characters as a SMS on a personal mobile device, thebrain automatically notes the physical context to where information was read and the mode ofdelivery. Adding more than one situational context can affect learning. Both physical location (Smith, 2013) and mode of delivery affect learning (Westera, 2011). Receiving a tweet on their mobile device has now provided an individual three memory cues for recalling the information:**where** one was when learning, **how** one received the information, and the **time** of day he/she received the information.

In addition to the contextual environment, mode of delivery and time of day, a tweet could ignite emotions that can later be associated with the information. The emotions could be aroused by the improper time in a life event when receiving the tweet, or an appropriate time of receiving a tweet (Cramp et al., 2012). Or, emotions could be stirred by the word content of the tweet. Fritsch and Kuchinke found enough difference in neuro-stimulation associated with known words to pseudowords to claim that recognized words had an emotional impact with individuals (Fritsch and Kuchinke, 2013). By tweeting information into the hands of the mobile device equipped student, there are multiple modes and models of learning that can be made available to aidin their learning.

3 PURPOSE

The purpose of this project is to learn if employing Twitter as a communication course requirement decreases the need to access the course CMS and results in a personalized multi-modal learning environment where studentsbecome more engaged with the course content and share more personal discoveries related to the course material in real-time.

4 PROJECT DESCRIPTION

This project uses Twitter (a mobile communications application primarily accessed via smart phones), Blackboard, (a web-based content management system (CMS)), and web videos, most likely hosted by a personal YouTube.com station or a video file uploaded to the school's webserver. Twitter will be used to supplement class communication hosted in the 'discussion' area of Blackboard, or through the 'announcement' area. All Twitter feeds are linked and stored in the Blackboard course for automatic archiving. These can be accessed at anytime through Blackboard.

Geographically diverse online graduate nursing informatics students will create a personalized Twitter account. With their Twitter account, they will interact with each other in real-time at anytime by sending tweets. A single class Twitter account has been established through GroupTweet.com. This software provides one Twitter account where multiple people can post and receive tweets. By using GroupTweet.com the students do not have to establish each classmate as a follower to their personal Twitter account. They only have to ensure that they follow the GroupTweet.com account established for the class. Establishing a GroupTweet.com account also permits the students and the instructor to maintain their personal Twitter account for personal tweets that are not to be shared with the class.

Students have access to assigned course readings and use the GroupTweet.com account to participate in class through Blackboard. Each week a different topic or aspect of information technology (IT) project management (PM) is introduced through lecture slides, a textbook, journal articles, blogs and newsfeeds. In the lecture material, the instructor provides an assigned task related to the weekly subject matter, or a question for the students to consider. Students create a personalized web video response for the question and then Tweet to the class that they have posted their web video response. Those receiving the tweet can then automatically open the video on their smartphone or their personal computer. Responses to the videos can be tweeted instantly upon review. This instantly connects the students at one time and documents the running dialogue that answers the posed question. It also eliminates the steps necessary to login to Blackboard to open the video, to simply add feedback.

During the 15-week course students are expected to tweet eight individual tweets to the class where they share a real-time life learning moment with the course content. This could simply be pushing a news article they discovered that related to one of the weekly topics, or it could be how they lived a PM moment in their life. This course requirement will bring 'real-life' into the virtual classroom and expose students to the practicalities of the course content. Within two of these eight 'life learning moments' they are to utilize the hashtag (#). This requirement has the potential to link previous tweets discussing the same topic throughout the term.

5 GOALS AND OBJECTIVES/RESEARCH QUESTIONS

Goals of this project in no specific order are the following:
1) Utilize the Internet based Twitter communication software to establish a multi-modal student learning opportunity;
2) Foster the growth of a personal learning network (PLN) that originates from the classroom and becomes a sustaining PLN outside of the classroom;
3) Reduce the students' need to access the CMS through a desktop or laptop computer as all course announcements and student postings are pushed through Twitter in real-time.

6 METHODOLOGY AND TIMELINE

Pending IRB approval a convenience sample of 10 geographically diverse online graduate nursing informatics students will engage with global class learning techniques (Twitter, web-based videos, and a CMS) daily/weekly for 15 weeks beginning early 2014.

Evaluation of the global learning experience will be collected at three time points from students through a formal online qualitative and quantitative questionnaire. Questions will cover students initial interest in Twitter, if they had an existing Twitter account, self reported expertise with Twitter, self report of hashtag deployment, ability to set alerts on their mobile device and more. Any feedback offered without solicitation will also be reviewed. Themes and changes in qualitative information will be recorded and discussed by the research team. The quantitative information will be assessed by examining response rates as well as an examination of the distribution of a total score.

GroupTweet.com and Blackboard provide statistics on users. The feasibility of this project will be assessed by examining frequencies of the number of times the tools are accessed, the time of day the tools are accessed, the length of time the students spend with each tool, and reasons why the specified software tool was accessed. All student feedback will be utilized to modify or supplement the project as needed.

7 BENEFITS AND ANTICIPATED OUTCOMES

The outcomes of this project will inform future deployment of Twitter as a learning tool in the mobile classroom environment.

By requiring use of technologies, students adopt the technology, step away from their routine, and learn something new; even if it makes them uncomfortable. Using global class learning tools, e.g. Twitter, web-based videos, and a CMS, is certainly nothing new but how they are used and blended together pushes the students to bring 'real life' tools into their world of learning.

With the right kind of assignments and the use of Twitter, 'just-in-time' learning could occur daily – multiple times. This extends the classroom into real-life, making the didactic content practical. Students are exposed to real-life situations and real-time situations while connected to their personal learning network. Thus, there is greater likelihood that the students can apply what they learn and retain that learning for future use.

Connecting the students remotely and having just-in-time interaction might establish a personal learning network (PLN) that would continue to function as an established network after the course is completed. A PLN could become as popular as social support networks and professional networks.

The novelty of the hashtag could reveal subject matter themes throughout the term that could then be used to incorporate future course content. It can also be used to link conversations together and extend the conversation into the public world.

The 140 character restriction used by Twitter will require the students to become more succinct, if not more creative, in what they share; that is, they will have to get the point across quickly. By creating 'blasts of information', students are ultimately chunking what they have to say. This provides the link to Miller's 1956 Chunking Theory. The human brain can only retain a certain quantity of information in one short instance. Miller's findings demonstrated that the human brain is capable of retaining 7 numbers, plus or minus two, in its working memory. Receiving a blast of limited information within 140 characters might have the same retention properties as 7, plus or minus 2 numbers. If this is the case, the modes of delivering academic lecture material will change worldwide.

8 CONCLUSIONS

There is some evidence of Twitter being used in the classroom but not by many (Lin et al., 2013, Seaman and Tinti-Kane, 2013). Over 7,000 college and university faculty completed an online survey on using social media in the classroom. A little over 9% reported using Twitter professionally and 60% of those users were from the applied sciences discipline (Seaman and Tinti-Kane, 2013). The faculty claimed concern for personal privacy risks of students as their reason for not utilizing social media such as Twitter. To address this concern in advance, the author is utilizing services from a third party software company with a mechanism to protect personal tweets and tweet to a private group.

There is a plethora of research and knowledge about human learning styles, learning mechanisms, memory tricks and instructional methods. This paper presented numerous discoveries around contextual learning and memory capacity. Twitter presently appears to satisfy multiple learning styles and deliver a succinct message quickly.

Significant time was spent constructing solid scaffolding for methodically deploying and using Twitter into an online course managed through a CMS. The next phase of this study will use this model design and introduce Twitter as a learning mechanism in a more analytical setting; an introduction to statistics course. Findings from this additional phase will be consulted to improve Twitter utilization for the faculty as well as the students.

REFERENCES

Cramp, A., Lamond, C., Coleyshaw, L. & Beck, S. 2012. Empowering or Disabling? Emotional Reactions to Assessment amongst Part-Time Adult Students. *Teaching in Higher Education,* 17**,** 509-521.

Davison, S. 2009. A Picture is Worth a Thousand Words. *Science and Children,* 46**,** 36-39.

Fritsch, N. & Kuchinke, l. 2013. Acquired Affective Associations Induce Emotion Effects in Word Recognition: An ERP Stud. *Brain and Language,* 124**,** 75-83.

Krauss, J. 2012. Inforgraphics: More than Words Can Say. *Learning & Leading with Technology,* 39**,** 10-14.

Lin, M.-F., Hoffman, e. & Borengasser, c. 2013. Is Social Media Too Social for Class? A Case Study of Twitter Use. *TechTrends,* 57**,** 39-45.

Loftus, G. R., Johnson, C. A. & Shimamura, A. P. 1985. How much is an icon worth? *Journal of Experimental Psychology: Human Perception and Performance,* 11**,** 1-13.

McKee, R. & Fryer, B. 2003. Storytelling that moves people. *Harvard Business Review,* 81**,** 51-55.

Miller, G. 1956. The Magical Number Seven, Plus or Minus Two: Some Limits on our Capacity for Processing Information. *Psychological Review,* 63**,** 81-97.

SALOMAN, G. 1979. *Interaction of Media, Cognition, and Learning,* San Francisco, Jossey-Bass.

Seaman, J. & Tinti-Kane, H. 2013. Social Media for Teaching and Learning. Babson Survey Research Group.

Smith, P. R. 2013. Psychosocial Learning Environments and the Mediating Effect of Personal Meaning upon Satisfaction with Education. *Learning Environments Research,* 16**,** 259-280.

Westera, W. 2011. On the Changing Nature of Learning Context: Anticipating the Virtual Extensions of the World. *Educational Technology & Society,* 14**,** 201-212.

Whitley, C. T. 2013. A Picture Is Worth a Thousand Words: Applying Image-based Learning to Course Design. *Teaching Sociology,* 41**,** 188-198.

Zhang, Y. A. 2012. Developing Animated Cartoons for Economic Teaching. *Journal of University Teaching and Learning Practice,* 9.