Communications of the Association for Information Systems

12-2011

Twitter, Google, iPhone/iPad, and Facebook (TGIF) and Smart Technology Environments: How Well Do Educators Communicate with Students via TGIF?

J.P. Shim
Department of Computer Information Systems, Robinson College of Business, Georgia State University, jpshim@cis.gsu.edu

Sasha Dekleva
School of Accountancy and MIS, Kellstadt Graduate School of Business, DePaul University

Chengqi Guo
Department of Computer Information Systems & Management Science, College of Business, James Madison University

Daniel Mittleman
School of Computing, College of Computing and Digital Media, DePaul University

Follow this and additional works at: https://aisel.aisnet.org/cais

Communications of the Association for Information Systems

CAIS

Twitter, Google, iPhone/iPad, and Facebook (TGIF) and Smart Technology Environments: How Well Do Educators Communicate with Students via TGIF?

J.P. Shim

Department of Computer Information Systems, Robinson College of Business, Georgia State University

JPShim@cis.gsu.edu

Sasha Dekleva

School of Accountancy and MIS, Kellstadt Graduate School of Business, DePaul University

Chengqi Guo

Department of Computer Information Systems & Management Science, College of Business, James Madison University

Daniel Mittleman

School of Computing, College of Computing and Digital Media, DePaul University

Abstract:

This article is a summary of a 2011 Association for Information Systems Americas Conference on Information Systems (AMCIS) panel discussion regarding current issues and future directions in the use of mobile technologies and social networks in education. The invited panelists are four faculty members from the United States specializing in Information Systems. The covered topics included evolution and history of e-learning, use of smartphones and tablets in education, development of social network services, and the use of social media (i.e., teaching with blogs and wikis) in the classroom. We discuss future directions in Twitter, Google, iPhone/iPad, and Facebook technology environments. Several resources for social media for college instructors are provided in the Appendix.

Keywords: e-learning, smart technology, tablets, social network service, social media, blog, wiki

Twitter, Google, iPhone/iPad, and Facebook (TGIF) and Smart Technology Environments: How Well Do Educators Communicate with Students via TGIF?

I. INTRODUCTION

Over the past several years, the use of smart technologies, which provide instantaneous mobile access to any app or feature at the touch of a fingertip, has burgeoned. This is true for devices such as any smartphone or tablet including features such as phone, e-mail, organizer, games, and Web browsers. Smart technology is undeniably one of the most influential modern-day inventions that have become available to this generation. Smart technology-based products are not only multifunctional but also versatile devices, as they provide real-time accessibility to anyone, anytime, and anything, in addition to time-saving applications. With users' physical world and virtual world intertwining, users increasingly find themselves immersed in the Twitter[TM], Google[TM], iPhone[TM]/iPad[TM], and Facebook[TM] (TGIF) environment, with an increasing need to stay connected to others via the most currently updated and smart technology. Research on smart technology in Information Systems (IS) is a very challenging research topic today. In addition, smart TV and augmented reality are becoming important research topics in Information Systems. The smart technology-based products are widely used in Asia, North and South America, Europe, and many other regions. We observe several other promising trends in the use of smart technology and augmented reality.

However, there are disadvantages and concerning aspects of the smart technology-based devices. Such issues include ergonomics, distractions caused by the Internet or text messages, and unreliability. Smart technology-based products are dependent on high bandwidth, which may be limited only to areas with population density. For educators aiming to reach rural areas with limited data access coverage, smart technology-based products may not be feasible. Another disadvantage may be the cost and lack of affordability of the smart technology-based products as well as the recurring costs associated with data plans, especially if the students are dependent on their parents for financial support. Other nontechnological aspects that may be significant disadvantages of smart technology-based products are students cheating during tests, distractions and disruptions during class time, and rumors spreading like wildfire. The bottom line is whether educators are in the right stage to create an environment in which there can be a continuous dialogue between educators and students.

The invited panelists at 2011 AMCIS discussed current issues and future directions as well as ways that educators can use to communicate with students in IS education via smart technology and TGIF. The panelists shared their teaching experiences in using blogs, wikis, and iPad. The report consists of four parts: (1) evolution and history of e-learning (i.e., multimedia-based training, Web-based training, distance learning, and learning under TGIF and smart technology) and history of computer-based instruction, (2) use of smartphones and tablets in education, (3) developing social networking service in classroom, especially using SoLoMo (i.e., Social, Location, Mobile media) for educational purpose, and (4) use of social media (i.e., teaching with blogs and wikis) in the classroom.

II. EVOLUTION AND HISTORY OF E-LEARNING

The concept of e-learning has created an entirely new paradigm for online training and education where the process of classroom instruction has expanded beyond previously defined boundaries of time and place limitations. Educators in all fields, ranging from education to IT to medical, have benefited from using a variety of tools and resources, such as e-learning tools, Web 2.0, and Web conferencing in seminars, courses, and training workshops.

As shown in Table 1, e-learning originally began via Computer-Based Training (CBT), through a CD-ROM, over the LAN (local area network), and then progressed on to Web-Based Training (WBT), on the Internet, with further developments leading to distance learning. Since the method of delivery of e-learning has expanded to include desktop, online or offline options, learners now have increased flexibility of incorporating not only the type of method of e-learning into their individual schedules, but also the pace at which they choose to learn and the flexibility of learning from home or office [Callahan et al., 2000].

E-learning has evolved in such a way that it is used in blended instruction, which is the methodology of blending or using two distinct methods of learning, including any of the following combinations: online face-to-face training, access to a faculty member or a coach, e-learning activities, and managerial coaching. The traditional classroom learning methodology was seen to be time-consuming and costly; and with the advent of technology discoveries, that methodology soon progressed to online courses, training workshops, or seminars. Participants no longer needed to travel to a fixed destination, obviating commuting time and high transportation costs.

Table 1: Evolution of E-Learning			
	Definitions	Advantages	Disadvantages
Multimedia-based training (MBT)	Self-paced interactive training presented on a CD-ROM using a variety of multimedia (e.g., audio and video).	● Easy access to training on computer ● No Web access needed	● No human contact ● Lack of instructor interaction
Web-based training (WBT)	Self-paced, anywhere, anytime instruction available on the Internet.	● Available on demand ● No travel required ● Cost efficient	● Technical issues ● Self-motivation needed to complete training
Distance learning	Instructor-led approach where instructor and participant are separated by place and/or time.	● Real-time mentoring ● No travel required ● Cost efficient	● Technical issues ● Limited interaction
TGIF and Smart Technology	Online technology in which students and faculty can actively contribute to and continually update course content in an online format.	● Easy access anytime and virtually anywhere.	● Technical Issues ● Security breaching issues

E-learning provides a personalized, interactive learning experience and flexibility for self-motivated learners by guiding users through a self-directed course. E-learning incorporates rich learning content and flexible options for content delivery to address the training objectives. The features have evolved to include media-rich information, such as audio, video, and Web conferencing, including face-to-face video chatting. Due to the enhanced learning process, content retention of the learners has increased by engaging multiple senses, including auditory, visual, and kinesthetic ones [Callahan et al., 2000].

As students or users progress throughout the e-learning training course, they can assess their knowledge level before, during, and after training to prepare for their certification or course exam. E-learning tools and features are catered to engage the learner in an interactive way, such as assessments, hands-on virtual labs, and—depending on the level of interaction—expert advice or face-to-face time with the instructor. These tools often track the learner's progress as well as history, often providing instant feedback as the learner is evaluated by a quiz or test.

Increased emphasis on social learning and use of social software has led to increased usage of technology, particularly Web 2.0-related technology, such as blogs, wikis, podcasts, social networking, and virtual worlds [Shim and Guo, 2009]. The information and materials needed for the course can be easily accessed online, in a setting free from time and place constraints. Regardless of the person's skill level or learning style, e-learning remains a cost-effective learning solution that is easily accessible and reliable. Figure 1 depicts a history of computer-based instruction.
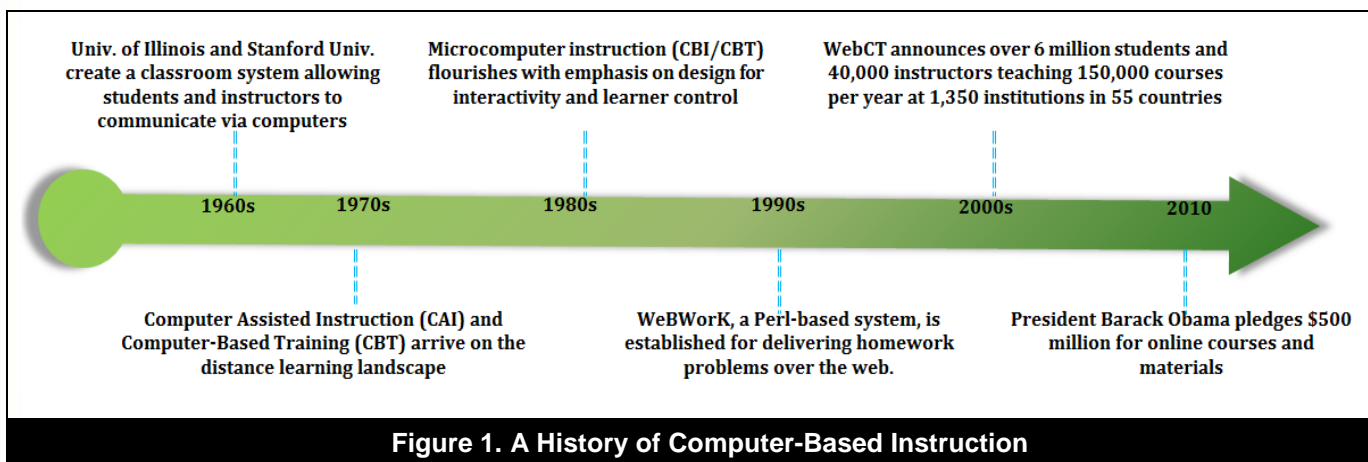

Figure 1. A History of Computer-Based Instruction

III. USE OF SMARTPHONES AND TABLETS IN EDUCATION

This section explores the use of smartphones and tablets in education. Although developers created a large number of apps for smartphones, which have been used in myriad different ways to support learning, the arrival of tablets has opened unprecedented opportunities to vastly improve teaching and learning.

Smartphones

All students are bringing their mobile phones to the classroom and most of them are smartphones, but many schoolboards ban the use of cellphones in class. Should such policies be revised? Students can get distracted. Not only can they text, IM, e-mail, photograph, and record, but they can also use the devices to cheat on tests. Proponents of the use of smartphones in classrooms suggest that students should be allowed to use phones during free time, such as lunch, and teachers should have an option to design their pedagogy around the use of mobile devices. The body of knowledge about the use of phones in education includes several books and many articles, blogs, and videos. Roxann Nys (http://roxannnys.pbworks.com/w/page/6883461/SmartPhones-in-the-Classroom) lists a number of useful apps and other technologies with comments and instructions on her periodically updated blog. Another proponent of the use of smartphone is, for example, North Carolina's Superintendent of Public Instruction June Atkinson (http://wn.com/High_Tech_Tools_in_the_Classroomwmv).

Some apps are designed specifically for smartphones, while others could be used with any phone, such as those based on SMS or Twitter. Yet another group of educational apps enable students to interact using Twitter, IM, or Web browser, which accommodates students using smartphones, laptops, netbooks, or tablets. One of them is Wiffiti, an interactive whiteboard for the classroom running inside a Web browser. Messages from various devices are instantly displayed, fade back and move as an animated board and are large enough to be viewable from a distance. Another such app is PollEverywhere, essentially a substitute for classroom clickers. Students respond to a teacher's question using phones, Twitter, or Web browser. Responses are immediately displayed via PowerPoint, Keynote, or in a browser.

Another category of smartphone apps includes those combining learning content delivery with testing and reviewing (e.g., EducationApps). Some apps add games to this combination forming a subcategory known as Game-based e-Learning to make their use more enjoyable (e.g., InQuizitor).

The reference category includes WikiMobile Encyclopedia app for Android smartphones, iPhone, and iPod. WikiMobile Encyclopedia enables users to carry over 2 million Wikipedia articles with them, including pictures. Google Mobile supports the SMS search—we can send a text message containing queries to 466453 (GOOGLE) and receive a result as a returned text message. Among other functions, this service brings a comprehensive dictionary to our fingertips. Of course, the sky is the limit for smartphone users with access to the Internet. The tx2ph.com offers free books formatted for small screens, and LibriVox offers free audiobooks from the public domain in the mp3 and ogg formats. Utility apps include reminders and alarms, which can be set to notify users about forthcoming assignments, project due dates, or tests. Another handy tool is a voice recorder, which can be used to store reminders, foreign language pronunciation, and so on.

Teachers and students can use phones to record voice over pictures and store these recordings in the cloud using free services such as Yodio. Watching a Yodio recording is not unlike observing a short prerecorded slide presentation. Classdroid is an Android app (other versions are forthcoming) that allows teachers to quickly take a picture of a student's work, grade it, and upload it to a student's or class's learning portfolio. Parents and students can then view their work and grades online.

Moving a step further, some institutions are developing online learning platforms and suites. For example [PRNewswire, 2011], the USC Rossier School of Education released an app for the iOS. Others are developing suites to create apps. For example, Mooestro (http://www.mooestro.com/apps/) mobilizes various elements of education experience, such as class information, scheduling and event notifications, messaging, class registration, and financial transactions by integrating internal systems (e.g., PeopleSoft) with cloud resources to facilitate the creation of custom mobile apps.

Tablet Revolution

People discovered thousands of apps and ways to use smartphones in education, but tablet computers with their larger screen sizes and additional functionalities have even higher potential to enhance education. The future of the textbook is fast changing. A concise video by Bulent Keles (http://vimeo.com/14448256) clearly demonstrates advantages of tablets in comparison with conventional printed textbooks in content delivery. We are now able to abandon the concept of pages bundled together in a predetermined sequence and start thinking of learning modules containing text, video, 3D objects, and other content that can be reordered and invoked on demand. Keles also talks

about converting a whole social network into a learning network using as an example a case when a learner enters a note as a question and her friend responds with an answer right away.

Indeed, unconventional publishers are finally developing new and much improved learning content in large numbers. One example is in the construction industry, traditionally considered a laggard in the use of IT. The Southern Pine Council developed a number of learning modules using voice over video to teach construction workers proper installation techniques [Nash, 2011]. In this case, the videos are formatted specifically for small size screens on smartphones. No wonder that some progressive environments plan to go paperless in schools. For example, all schools in South Korea will begin to use tablets in 2015. There will be no more paper (http://www.technologyreview.com/blog/mimssbits/26960/?ref=rss).

Not surprisingly, conventional textbook publishers are noticing this wave of change. The VP of McGraw-Hill Higher Education eLabs, Vineet Madan, reports that tablets are ready for the classroom [2011]. He wrote: "Using a single textbook for class might be easier for the teacher, but it is an outdated standard that does not rise to the era we are in." Consequently, McGraw-Hill appears to be the first leading textbook publisher coming out with a digital-only textbook for K–12 level of education (http://mashable.com/2011/06/27/iste-textbooks-k-12/). This e-book will be used as a primary text instead of just its supplement.

Kindle Fails, But iPad Exceeds Expectations

It turns out that not all tablets are suitable for the classroom. Seven U.S. colleges, including the University of Washington Foster School of Business and University of Virginia's Darden School of Business, tested the large-screen Kindle DX in 2009 [Taylor, 2010]. By the second semester, most students had abandoned their Kindles. Many complained that it was difficult to use features such as highlighting text and taking notes. Amazon's device was designed for reading books, magazines, and journals, but appears to be too rigid for use in the classroom where students need to shuffle back and forth through their materials. Consequently, schools have focused their attention to Apple's iPad. Many business schools, including Georgia State University's premium master's programs (Professional MBA, Executive MBA), International Institute for Management Development in Lausanne, Wharton, IESE Business School in Barcelona, and Nyenrode have been using or testing iPads loaded with curriculum materials. XanEdu tested iPads at eleven MBA programs including NYU's Stern and Boston University's School of Management. Some other business schools testing iPads are Grenoble's Ecole de Management, W.P. Carey School of Business at Arizona State University, University of Virginia's Darden School of Business, Ashridge Business School in the UK, Hult International Business School, and University of Notre Dame Mendoza College of Business. University administrators do not want to test them only for distribution of course materials, but to see if their use is really the next stage in the evolution of teaching and learning. The program at University of Notre Dame Mendoza College of Business was even more specific—the goal was to design an "ePublishing ecosystem" to serve faculty, students, and staff by streamlining the creation, distribution, sharing, reading, and annotation of eMaterials in a cost-effective manner. They reported their findings and found it striking that, on average, students feel that iPad encourages exploration of additional course topics, helps manage time, provides new functions and tools, increases learning, and makes courses more interesting [Bilton and Malinowski, 2010].

Among other advantages identified in their study are iPad's portability, consolidation (having everything in one place), long battery life, versatility (VoIP, texting, e-mail), connectedness, e-mailing is much easier on iPad, calendar is similarly more effective than on smartphone, and iPad is also great for games. Bilton and Malinowski also reported several negative students' comments, but the researchers reported that "[t]he ancillary benefits of the iPad (consolidation of personal/school lives, constant connectedness, etc.) outweigh the device's drawbacks as an academic tool."

Open Textbooks

Open textbooks can change the way textbooks are used, produced, and sold, says Nicole Allen, director of the Make Textbooks Affordable campaign by Student Public Interest Research Groups [Shkolnikova, 2008]. Over 2,500 college and university faculty from all fifty states in the U.S. have signed a pledge to consider open textbooks. Open textbooks are high-quality college texts offered online under a license that allows free access to digital format and a low-cost print version. In some cases the textbooks are also available for free in printable pdf format. The open license usually allows faculty to tailor the text according to the needs of their courses by editing the content, selecting only desired sections, and adding new material, provided that the modified text becomes available under the same license.

The OpenCourseWare Consortium (http://www.ocwconsortium.org/) is a collaboration of higher education institutions and associated organizations from around the world creating a broad and deep body of open educational content using a shared model. Its vision is a world where a desire to learn is fully met by the opportunity to do so in

an affordable and educationally appropriate way. The Consortium website offers advanced search for available courses.

College Open Textbooks (http://collegeopentextbooks.org/) is a collection of colleges, governmental agencies, education nonprofits, and other education-related organizations that are focused on the mission of driving the awareness and advocacy for open textbooks.

Flatworldknowledge (http://www.flatworldknowledge.com) is a large publisher of free and open college textbooks. It offers quality books by expert authors in a conventional digital and printed textbook format. The textbooks can be customized and have been used by over 115,000 students. They are free online, but can be ordered in printed format. The books come with conventional supplements, such as instructor manuals, testbanks, and lecture slides. As a contrast to this model, Connexions (http://cnx.org/) is a site to view and share educational content produced in small knowledge chunks called modules. The modules can be organized as courses, books, reports, lectures, or supplements. This collection is quite extensive and includes a large number of initiatives such as the Global Text Project (http://globaltext.terry.uga.edu/home), which in turn lists and links to a number of other open content projects.

Commons Open Educational Resources (OER) (http://www.oercommons.org/) is essentially a catalog of free teaching and learning content from around the world with advanced search capability. The site provides reviews, instructions, and suggestions for teaching as well as many other aspects of education. Similarly, Open Text Book (http://www.opentextbook.org/) is a registry of textbooks that anyone can access, reuse, and redistribute, but it provides additional valuable content such as search by subject and links to numerous blogs and sites related to the open textbook movement. The Open Knowledge Foundation (http://okfn.org/), a not-for-profit organization founded in 2004 to promote open knowledge, runs the Open Text Book site. The Student Public Interest Research Groups (http://www.studentpirgs.org/open-textbooks/catalog) is another catalog of open textbooks that are licensed to be free online and affordable in print. The titles on this list were selected for their usability and number of adoptions. Webster University's Library (http://libguides.webster.edu/content.php?pid=190218) compiled another site listing links to open source book projects. The Creative Commons licensing is also described there. The UCSB Library maintains a similar resource (http://guides.library.ucsb.edu/content.php?pid=106841&sid=811698).

IV. MOVING FORWARD: DEVELOPMENTS OF SOCIAL NETWORK SERVICE (SNS)

Currently, there is a great demand for development of concepts and practices through which educators can reap the benefits of rapidly evolving social media/tools. This is an imminent issue especially for CIS/MIS educators since they are expected to take the leadership role of innovative use of technology in teaching. Therefore, we provide an overview of social networking service and its derivatives in mobile computing, discuss how applications such as location-based service can nurture more effective student–instructor interactions, and outline the opportunities/ challenges facing the CIS/MIS community in pedagogical innovation. We further propose that SoLoMo (social-location-mobile) will become a major influence not only to education, but society at large.

Overview of SNS

A conspicuous strength of an information communication technology (ICT), as argued by Parker and Van Alstyne, is its capability of matching, networking, or filtering various kinds of information content [2005]. These days, ICT's matching capability has been extended to a new domain where human beings can be associated with each other. Dhar and Sundararajan further contend that as the personal social network grows, products that derive their values from such a network would become more valuable [2007]. Social Network Service (SNS) refers to the relationship building and maintaining service that establishes Web-based interpersonal networks through a bevy of software and networking applications, whose main focus is managing and aggregating knowledge and information that is relationship oriented. In some discussion contexts, SNS is considered as the new applications and services that facilitate collective action and social interaction online with rich exchange of multimedia information and evolution of aggregate knowledge [Parameswaran and Whinston, 2007].

When SNS Meets Mobile

SNS is now growing with mobile technology that has significantly changed the way in which people stay connected. The smart handheld telecommunication device (e.g., iPhone) serves as a multitasking platform bridging social contexts such as professional and personal worlds, making mobile information exchange possible. Owned by Apple Company, the App Store serves as an online hub for mobile applications. The current market of mobile applications is rife with social media oriented tools. Mainstream social media providers such as Facebook, Twitter, and LinkedIn offer their respective mobile apps that could be developed by a third party. Such proliferation can be attributed to the increasingly affordable hardware device and more robust telecommunication services (e.g., LTE network and widely

available Wi-Fi hotspots). Table 2 compares major online social platforms, including those that emerged before SNS.

Table 2: Comparing Online Social Platforms				
	Distribution Speed	Information Richness	Topic Orientation	Level of Interaction
Weblog	Moderate	High	Focused	High
SNS	Moderate	High	Dispersed	High
BBS	Moderate	High	Dispersed	High
Mobile SNS	Real Time Fast	Moderate	Dispersed	High
Home page	Slow	High	Focused	Low

SoLoMo: An Integrated Service Innovating Social Networking

The success of e-commerce has largely been built upon ICT's groundbreaking achievement—information exchange despite geographic barriers. Today, geographic information has become an important ingredient to social networking innovation. Coined by John Doerr, a partner at KPCB, SoLoMo represents Social, Location, and Mobile media. Some even went one step further and argued the term is embodied by Facebook, Google, and Apple, who respectively assume the dominating positions in social network service, online search engine, and mobile device manufacturing. Compared to the other two concepts, Location Based Service (LBS) is a new addition to the SNS family. By utilizing GPS and data communication networks, a mobile device is able to pinpoint the location of the user and render it to APIs belonging to various developers. For instance, each time a Twitter user enters a new twit, s/he has an option to disclose his/her location within the message. The same information can also appear in Facebook posts, Amazon reviews, and Google search. Having one's location is more than just telling others where you are. LBS allows one to be more aware of one's social surroundings and thus make better informed decisions. Additional real-life illustrations are given in the following sections.

Using SoLoMo in Digital Social Contexts

Rivaling Apple's iOS for smartphones, Android attempts to form alliances with Nokia, Motorola Mobile (now part of Google), HTC, and other smartphone makers. Both mobile operating systems have fully embraced LBS and are supporting more than just the concept of being "social." As pointed out by Michael Boland [2011] in *Search Engine Watch*:

We're seeing accelerated promotion of products that fuse social, local and mobile media…. It's now taking on new forms with growing smartphone penetration, and a Groupon-fueled hunger for the deals infused with apps carrying the SoLoMo banner.

LBS offers a brand new perspective of human interaction. Using LBS applications, instructors can better engage students, promote after-class academic pursuits, and improve learning effectiveness. Foursquare is a mobile application that allows users to "check in" to locations on their cell phones. Doing so makes it easy to know where others are as long as they belong to the same network (see Figure 2). The top left oval of Figure 2 indicates the POI (places of interest), as well as how many people are currently checked in. This information is customized according to a user's current physical location in Foursquare, a popular LBS application with more than 7.5 million active users. The bottom oval indicates the check-in page where a user's information can be updated automatically in his/her Facebook/Twitter account. The center-top oval indicates who has checked into the same places as the user has. The top right oval allows the user to contact those who are in the same place through methods such as text messages, phone call, e-mail, Facebook update, or Twitter. A course instructor can obtain a living image of his/her students (if they are friends in Foursquare) regarding their movements. Having such information is valuable in terms of after-class collaborations, especially beyond office hours. Real time communication can be established between instructor and students outside the classroom and office, hence bridging the social contexts of different stakeholders. In this way, instructors can react to a student's concerns more promptly and encourage after class academic activities. Students, on the other hand, obtain better understanding of class materials and build a stronger tie with the instructor.

In other contexts, such as social commerce, LBS plays a critical role in innovating how vendors reach out to customers and vice versa. The Groupon mobile app delivers deals to consumers based on their locations, as Figure 3 indicates. Users can share their comments and deals among their friends. Businesses can offer special promotions to consumers and build loyalty initiatives through a low-cost channel, as compared to traditional advertising. More importantly, these perks are customized to local preferences and thus better positioned. There has been a 400 percent increase in the number of mobile searches in 2011 versus 2010. Seventy-four percent of people

Figure 2. Foursquare Interface

use their mobile phones to search while running errands. Sixty-three percent of people are using mobile before purchasing offline or via a catalogue. Fifty-nine percent of people use their mobile phone to share content while shopping [Barone, 2011].
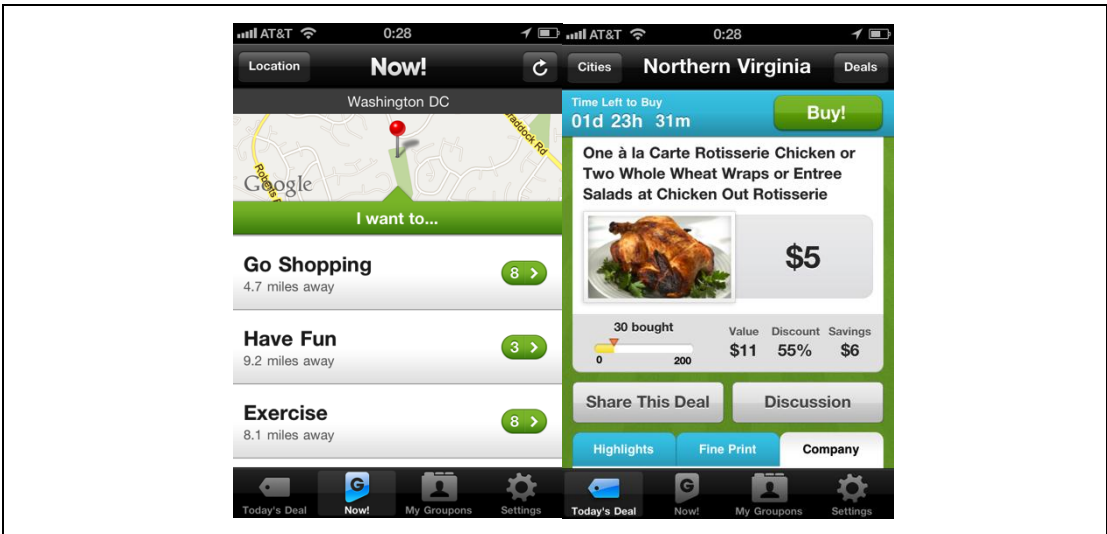

Figure 3. Groupon's Interface Presents Location

Concerns and Challenges

Currently, there are several caveats for using SoLoMo for educational purposes.

- Cost of ownership: Although purchasing hardware and subscribing to a service have become more accessible, digital gaps still exist within schools, classrooms, and groups of students.

- Discrepancy of service penetration: Due to the diversity of service innovation and lack of cross-platform capability, we do not expect to see a consistent development of the same service in the future.

- Stickiness: Adhering to a certain model of communication has been a challenge. New inventions emerge on a regular basis and users can be frustrated by daily changing technology.

- Mental preparedness of instructors who answer high-tech inquiries from students.

In addition to the above concerns, privacy issues should not be overlooked in both educational and social commerce contexts. Since SoLoMo relies heavily on a user's location, its use raises questions of who is watching, why they watch, and how user data is distributed.

V. USE OF SOCIAL MEDIA IN THE CLASSROOM

This section explores the use of social media to support learning in the classroom, in particular the use of blogs for discussion support, wikis for collaborative authoring, and group environments for student project team support. Social media tools support both constructivist and collaborative learning pedagogies [Crook et al., 2008]. They help students create and map knowledge to their own life experiences. Further, carefully selected and configured social media tools support effective structured collaboration, preparing students with virtual work skills that will help them navigate in the twenty-first century workplace. These tools also adapt well to different learning environments, from traditional classroom, through blended, to pure online learning courses.

While the commonly used Learning Management Systems (LMS)—Blackboard, Desire2Learn (D2L), and Moodle, for example—integrate considerable social media functionality under the hood, some instructors may find LMS solutions constraining. Fortunately, there are many low-cost and free Web 2.0 alternatives that offer different or greater functionality. Several advantages exist from staying within the LMS umbrella: single sign-on and single destination sandbox is inherently simpler for nontechnical students; and the firewall of the LMS may support confidentiality policies that exist at some institutions. On the other hand, many of the Web2.0 social media offerings contain useful functionality not available in an LMS. The right solution will depend on the particular situation. This section lays out social media tool functions based on three basic forms of classroom interaction. While some Web 2.0 products are mentioned (with URLs at the end of the section), it is for the reader to determine the best product solution in each case.

Demand for Social Media in the Classroom

It makes sense that students will gravitate toward using social media. The 2011 PEW/Internet Report on College Students reports that 99 percent of all college students in the U.S. are Internet users [Smith, 2011]. Ninety-two percent of all undergraduates and 88 percent of all graduate students use wireless connectivity (smartphone, tablet, or laptop) to access the Internet, well above the percentages for the adult U.S. population as a whole. In spite of this level of social media use, most college students have not been taught to evaluate their media choices or message structures. They have developed a vernacular based on the social norms of middle and high school. The college classroom provides the laboratory for these students to evolve their communication habits into effective collaboration skills they can use in the workplace.

And the twenty-first century workplace most definitely demands such skills. Not only is work becoming more virtual: WorldatWork estimates that more than 26 million American workers telework at least one day a month [Moore et al., 2011]. These numbers, as a percentage of the workforce, grow each year. In addition, more of this virtual work is becoming international. One implication is that work becomes more virtual, more collaborative, and more likely multicultural [Friedman, 2005]. Teaching with social media creates the opportunity to model effective online engagement and effective virtual collaboration.

Teaching with Blogs

In spite of the prevalence of Internet use by college students, surveys of our students suggest that many current students are comfortable only with e-mail or texting. Many, if not most, are consumers of social media but have never commented on a blog, never contributed to a wiki, and never reviewed an online product. Surveying your students about their social media behaviors is an excellent first step to broach the conversation of possibilities with them. An excellent second step is to require them to contribute to a blog, wiki, or shopping review.

Using a blog as your discussion environment enables several interaction structures for you to consider.

1. It provides the opportunity to manage discussion by creating the posts, while the students comment on the posts. You might encourage structured discussion of a reading assignment. You might post a question (along with resource material) to generate discussion prior to same-time class discussion. You might encourage continued development of a class discussion after the class period ends.

2. It provides the opportunity to modularize discussion by assigning students to create limited posts or posts within particular categories. Students might be invited to dive deep into a topic of their own choosing—an implementation of constructivist learning theory. Or students might draw topics by lot, investigate, and share with their classmates.

With any of these methods, blog-based discussions are focused, measureable, and monitorable. They can enhance between-class learning for traditional in-room courses, or provide structure to discussion environments for blended and online courses. One significant advantage to text-based discussion, often overlooked, is that it levels the playing field for English as a Second Language (ESL) students and students who have social or cultural reticence to speak up in class. Text discussion permits these students to take their time in forming their words and provide for a semianonymity that makes engaging in conversation more likely [Nunamaker et al., 1997].

In order to effectively teach with a blog discussion, instructors might consider several best practices:

1. Provide the students with your participation expectations and grading model up front, with a high degree of clarity. It is easy to grade on quantity of participation and difficult to grade on quality; however, since you want to encourage quality, it is important to reward it. Therefore:

   a. Provide students with a rubric that lays out what you expect from an "A" post, a "B" post, a "C" post, etc.[1]

   b. Model what you expect of students with your own posts, with previous semester student posts, or with early posts by confederate students. Cite and praise posts that fit your model.

   c. Provide students with graded feedback one third of the way through the semester so they know whether they are meeting expectations and have an opportunity to correct course.

2. It may be too difficult to grade for quality every post by every student over the course of a semester. Therefore, you need a strategy to provide valid grades and relevant feedback.

   a. You might inform the students up front that you will be grading random posts throughout the semester, and then do so.

   b. You might establish a model whereby the students, provided they have reached a minimum quantity, may self-select and submit to you X count of posts for grading. This option not only gives you a feasible quantity of material to grade, but also relieves the student of the stress of perceiving she must treat each post as a polished essay, a barrier that leads many to significant apprehension and writer's block.

3. Select an appropriate blogging platform.

   a. First look at the blogging or discussion platform in your LMS and determine whether it will meet your needs. The Blackboard and D2L platforms do not meet our needs, as they are limited in blogging functionality and they do not provide quantitative contribution data we need for student evaluation. If you consider an external blogging tool, look for an environment you are comfortable managing. Posterous is the simplest blogging platform we know of, but its feature set is limited. Blogger (from Google) is also very simple to use. We employ WordPress blogs (using a plugin called "Export Comment Authors" to generate a count of student contributions.) WordPress is a bit more difficult to manage but provides a significant degree of customization and functionality.

Teaching with Wikis

Most students know wikis through their experience using Wikipedia as an encyclopedic tool. We teach this knowledge management aspect of wikis, but also teach wikis as an effective collaborative authoring environment. Collaborative authoring is a valuable virtual work skill that does not develop natively by students using social media. Effective collaborative authoring must be taught. There are three principal models for collaborative authoring [Adkins et al., 1999]. Most students default to a parallel model where the work task is split into slices, each student is assigned a slice to work individually, and then at the end an editor tries to reassemble the individual work. This often results in a low-quality work product and a frustrating team experience. In the workplace, this parallel method may

---

[1] One of the authors of this paper has posted a blog grading rubric online at iTeach-Social Media (reference at the end of this section).

be employed, but a second equally frustrating method of serial authoring is often employed whereby the entire work product is begun by one author who then hands it off down a chain with each teammate working alone. This, too, may result in a low-quality work product—and may be delayed indefinitely by one slow author.

Effective collaborative authoring employs a third model called reciprocal authoring. In this model a shared single work product is stored virtually and each author may check out a section of the work product for editing. This method, if poorly guided, may devolve into parallel authoring, but, if well facilitated, can be fast, effective, and rewarding—resulting in a high-quality work product. While tools such as Google Docs are often used for Web-based collaborative authoring, wikis can be more effective, as the natural page structure of wikis provides readily available structures for checkout. Further, most wikis support storage of guidance or reference documents and the ability to make meta-comments on a discussion page. Thus a wiki structure can be an extremely effective tool for an instructor to model collaborative authoring processes.

Most LMS have limited or no internal wiki structures, so one may need to look to Web 2.0 solutions. There are many free wiki environments that work well; we have been using PBWorks for several years. PBWorks has an educational plan that provides reasonable functionality at no cost; it supports the basic needs of collaborative authoring; and has a user interface that most students can easily learn. Other faculty we know use WikiSpaces.

For several years now, we have been employing PBWorks as a platform for our students to author their own textbook. We find this an effective constructionist way of supporting the students to learn and explore cutting edge course material for which standard textbooks do not exist. Wikis can also be used to teach argumentation. We have employed wikis as a platform to support online students engaging in formal social issues debates. We assign debate topics and sides; then the instructor templates the wiki environment so that it is clear to students where debate arguments are to be placed. We set a posting deadline for initial arguments so that both sides post at approximately the same time. We then provide a week for each side to digest the opponent's post and author a rebuttal. Then we give another week for generation of final argument. All of this is handled public to the class so each dyad can read the arguments of the other dyads. We find that students model subsequent arguments based on best practices of other students (as the topics differ, they are not plagiarizing specifics, merely modeling argumentation and citation styles).

Teaching with Teaming Tools

We have found that many students find team projects frustrating and unrewarding. In spite of this, we believe effective teaming skills—and effective virtual teaming skills—are significant differentiators for success in the twenty-first century workplace. The disconnect may be that many instructors place students onto teams, but do not teach students how to work in team settings. Therefore, our approach to employing virtual teams in our courses is to model, support, and encourage reflection on each aspect of the teaming process.

Team projects consist of managing ongoing different time teamwork and same time, sometimes virtual, meetings. To support ongoing teamwork, we provide students with an environment that supports shared (cloud) document storage and different time discussions (with tools to push discussion comments to primary e-mail, or SMS addresses—as students can't be expected to visit the teaming environment to pick up messages.) Note that an LMS that can't send messages outside the firewall to e-mail or SMS will not support effective teamwork. Task assignment and calendaring tools can be helpful as well.

Desire2Learn has a fairly effective solution for this kind of team support; however, we have been using a Web 2.0 tool called *Wiggio* that has a simple user interface and both same-time and different-time functionalities. For same-time meeting support, we have been encouraging students to acquire and use Skype accounts. Some students have opted toward alternative platforms (Oovoo, for example, and Wiggio supports VoIP), but facility with Skype is a pre-requisite for effective virtual work in the workplace today. We encourage—and model for students—the use of Skype chat during a conference call for shared note taking and assignment tracking and the functionality of leaving the chat window live between calls for effective team IM chat. We also introduce free telephone bridges (e.g., freeconferencecall.com, as one of many) to the students.

VI. CONCLUSION

The major intent of this recapitulation of the AMCIS 2011 panel discussion was to present four distinct perspectives on e-learning, use of smartphones and tablets in education, development of social network services, and use of social media in the classroom. This panel discussion offers several first-hand practices and insightful perspectives about utilizing innovative IT artifacts in pedagogical environment.

The term of E-Learning has been used in various ways for almost a decade. Groundbreaking achievements have been made, notwithstanding limitations, such as limited richness of in-class interactions. As the cost of ownership continuously decreases, ubiquitous access of data is highly desired among distance learning participants. Having such capability increases the level of knowledge sharing, virtual collaboration, and content portability. On the other hand, there are certainly caveats whenever new tools are adopted. Some lessons learned include: certain artifacts (e.g., Kindle) do not have a good fit in the classroom due to operational hardships; there is a discrepancy of service penetration due to the diversity of service and lack of cross-platform capability; adhering to a certain model of communication is a major challenge to continuous service subscription; and the explosive growth of smart technology could lead to user's frustration.

Another important discussion relates to the interesting applications of social media in classrooms. Not only is the knowledge aspect involved, more importantly, the mechanism of effective collaboration through social media (e.g., Blogs, Wikis) is taught and practiced in today's higher education. Such mechanism is beneficial to a student's future career in a sense that businesses have been increasingly relying on virtual teamwork and cross-country/culture collaborations. By using such methods as reciprocal authoring, students gain experience in making meta-comments, avoiding parallel authoring, and improving clarity of communications. These meta-comments made in the classroom could become valuable inputs of successful work product in real business exercise.

Research on smart technology is an imminent and challenging task. In addition, the existing digital gaps are expected to be widened due to the unbalanced investments on IT infrastructure between developed and less developed areas. Nontechnical aspects (e.g., IT economy, e-governance) of smart technology research must also be encouraged. Ergonomics and user friendliness remain important subjects. Behavioral issues, ranging from academic dishonesty to social network abuse, certainly hinder educators from effectively utilizing pedagogical gadgets. Hence, having a healthy dialogue between educators and students is always essential to a positive learning/teaching experience.

ACKNOWLEDGMENTS

REFERENCES

Editor's Note: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the article on the Web, can gain direct access to these linked references. Readers are warned, however, that:
1. These links existed as of the date of publication but are not guaranteed to be working thereafter.
2. The contents of Web pages may change over time. Where version information is provided in the References, different versions may not contain the information or the conclusions referenced.
3. The author(s) of the Web pages, not AIS, is (are) responsible for the accuracy of their content.
4. The author(s) of this article, not AIS, is (are) responsible for the accuracy of the URL and version information.

Adkins, M., et al. (1999) "GSS Collaboration in Document Development: Using GroupWriter to Improve the Process", *Proceedings of the Thirty-Second Annual Hawaii International Conference on System Sciences*, IEEE Computer Society Press: Los Alamitos, CA [on CD-ROM].

Angst, C.M. and E. Malinowski (2010) "Findings from eReader Project, Phase 1", Working Paper, Dec. 21, http://www.nd.edu/~cangst/NotreDame_iPad_Report_01-06-11.pdf (current Aug. 2, 2011).

Barone, L. (2011) "The SoLoMo Revolution: Social Media, Local Search & Mobile Search Collide", *Outspoken Media,* June 7, http://outspokenmedia.com/internet-marketing-conferences/the-solomo-revolution-social-media-local-search-mobile-search-collide/ (current June 7, 2011).

Bilton, N. (2011) "Tablet Buyers Only Want the iPad, Report Says", *The New York Times Bits,* Aug. 17, http://bits.blogs.nytimes.com/2011/08/17/tablet-buyers-only-want-the-ipad-report-says/ (current Aug. 20, 2011).

Boland, M. (2011) "Discovering the Right SoLoMo Formula", *Search Engine Watch,* March 11, http://searchenginewatch.com/article/2067618/Discovering-the-Right-SoLoMo-Formula (current Oct. 27, 2011).

Callahan, E.R., J.P. Shim, and G.W. Oakley (2000) "Learning, Information, and Performance Support (LIPS): A Multimedia-Aided Approach", *Interfaces* (30)2, pp. 29–40.

Crook, C. (2008,) *Implementing Web 2.0 in Secondary Schools: Impacts, Barriers and Issues*, Coventry, UK: British Educational Communications and Technology Agency, Sept.

Dhar, V. and A. Sundararajan (2007). "Information Technologies in Business: A Blueprint for Education and Research", *Information Systems Research* (18)2, pp. 125–141.

Friedman, T.L. (2005) *The World Is Flat: A Brief History of the Twenty-First Century,* New York, NY: Farrar, Straus & Giroux.

Frith, J. (2009) "The Open Revolution: An Environmental Scan of the Open Textbook Landscape", *NCSU Libraries Digital Scholarship & Publishing Center,* Aug. 1, http://www.lib.ncsu.edu/dspc /opentextbookswhitepaper.pdf (current Aug. 25, 2011).

Hodgkinson–Williams, C. (2010) "Benefits and Challenges of OER for Higher Education Institutions", *Centre for Educational Technology, University of Cape Town,* http://www.col.org /SiteCollectionDocuments/OER_BenefitsChallenges_presentation.pdf (current Aug. 23, 2011).

Madan, V. (2011) "6 Reasons Tablets Are Ready for the Classroom", *Mashable*, May 16, http://mashable .com/2011/05/16/tablets-education/ (current July 30, 2011).

Moore, B., M. Rhodes, and R. Stanley (2011) "Telework 2011: A WorldAtWork Special Report", June, http://www .worldatwork.org/waw/adimLink?id=53034 (current Dec. 20, 2011).

Nash, S.S. (2011) "Construction Career Education Innovations: Smartphone and Tablet-Friendly Instruction Materials", *eLearners.com* July 5, http://community.elearners.com/all_blogs/inside_elearning_by_susan_ smith _nash_ph_d_/b/inside_elearning/archive/2011/07/05/construction-career-education-innovations-smartphone- and-tablet-friendly-instructional-materials.aspx (current July 31, 2011).

Nunamaker, J., et al. (1997) "Lessons from a Dozen Years of Group Support Systems Research: A Discussion of Lab and Field Findings", *Journal of Management Information Systems* (13)3, Winter, pp.163–207.

OATTF (2010) "Final Report", Feb. 27, http://www.openaccesstextbooks.org/pdf/OATTF_Final_Report_All_sections .pdf (current Aug. 25, 2011).

Parameswaran, M. and A.B. Whinston (2007) "Research Issues in Social Computing", *Journal of the Association for Information Systems* (8)6, pp. 336–350.

Parker, G. and M.V. Alstyne (2005) "Two-Sided Network Effects: A Theory of Information Product Design", *Management Science* (51)10, pp. 1494–1504.

PRNewswire (2011) "The University of Southern California's Rossier School of Education Releases a Mobile Version of its Groundbreking MAT@USC Learning Management System", March 28, http://www.prnewswire .com/news-releases/the-university-of-southern-californias-rossier-school-of-education-releases-a-mobile- version-of-its-groundbreaking-matusc-learning-management-system-118763739.html (current Aug. 2, 2011).

Shim, J.P. and C. Guo (2009) "Empirical Research: Weblog Technology for Instruction, Learning, and Information Delivery", *Decision Sciences Journal of Innovative Education* (7)1, pp. 171–193.

Skholnikova, S. (2008) "Online 'Open Textbooks' Save Students Cash", *USA Today,* July 7, http://www.usatoday .com/news/education/2008-07-09-open-textbooks_N.htm (current Aug. 21, 2011).

Smith, A. L.R. (2011) "College Students and Technology", *Pew Internet & American Life Project,* July 19, http:// pewinternet.org/Reports/2011/College-students-and-technology.aspx (current Sept. 10, 2011).

Taylor, P. (2010) "E-Books Fail the Classroom Test", *FT.com,* Sept. 6, http://www.ft.com/cms/s/2/e185bce2-b76a- 11df-839a-00144feabdc0.html#axzz1TKFLePod (current Aug. 2, 2011).

APPENDIX A: RESOURCES ABOUT SOCIAL MEDIA FOR COLLEGE INSTRUCTORS

Several online resources exist that may be helpful to the college instructor looking to explore social media pedagogy and tool sets. Here are some recommendations (as of the Fall of 2011).

Online Faculty Communities
- iTeach Social Media www.iteach-socialmedia.com
  This is a new and growing community restricted to college faculty who teach social issues of technology or social media courses. This community includes a repository of teaching materials, focused discussion boards, links to relevant RSS feeds, and a blog.[2]
- Techology-Using Professors group (on LinkedIn) http://www.linkedin.com/groups?home=&gid=934617
  This is a community of instructors featuring active Q&A discussions.
- Social Learning Community (on Yammer) www.yammer.com/sociallearningcommunity
  This is a Community of Practice for those interested in social learning and the use of social media for learning and working. The focus of the discussion is on how we learn *differently* with social approaches, NOT just on its application in formal education or training.
- Share&Learn www.c4lpt.co.uk/shareandlearn
  This is a collaboration platform where members can share links, resources, ideas, experiences, tips, etc. about the use of learning and performance trends, technologies, and tools, and learn from one another— both informally and formally.

Useful Lists on websites and blogs
- Best social media mash-ups in higher education
  http://patrickpowers.net/2010/12/best-social-media-mash-ups-in-higher-education/
- Free Technology for Teachers
  http://www.freetech4teachers.com/
- Web2.0 resources for Students
  http://educationaltechnologyguy.blogspot.com/2011/09/updated-summary-of-great-web-20.html
- Top 100 Tools for Learning
  http://c4lpt.co.uk/top-tools/top-100-tools-for-learning-2011/
- 21st Century Educational Technology and Learning
  http://21centuryedtech.wordpress.com/

Large Lists of Web2.0 Collaboration Tools
> http://thinkofit.com/webconf
> http://www.web-based-software.com
> http://www.go2web20.net
> http://www.ziipa.com
> http://php.opensourcecms.com
> http://www.allthingsweb2.com
> http://www.weblogmatrix.org

Products Mentioned in this Section
- Blackboard   www.blackboard.com
- Desire2Learn   www.desire2learn.com
- Moodle   www.moodle.org
- Posterous   posterous.com
- Blogger   www.blogger.com
- TypePad   www.typepad.com
- WordPress   www.wordpress.org
- PBWorks   www.pbworks.com
- WikiSpaces   www.wikispaces.com
- Wiggio   www.wiggio.com
- Oovoo   www.oovoo.com
- Skype   www.skype.com

---

[2] This community is curated by one of the authors of this article.

ABOUT THE AUTHORS

J. P. Shim is a professor of Computer Information Systems at Robinson College of Business at Georgia State University. Before joining at GSU in 2011, he was professor of BIS and Larry and Tonya Favreau Notable Scholar at Mississippi State University. During the past twenty-seven years at MSU, he was a seventeen-time recipient of outstanding faculty awards. He has published five books and seventy journal articles. His coauthored paper has been cited as top in SSCI citations, Elsevier citations, and downloads in DSS. He serves on Wireless Telecommunication Symposium as Program chair. He has received awards, grants, and distinctions, including NSF, Microsoft, U.S. Small Business Administration, and Japan Foundation. He is a frequent speaker at universities and companies in thirty countries. He has been interviewed by the media (CBS TV, Associated Press) and worked as consultant for Booz Allen, U.S. EPA, KIA Motors, and others.

Sasha Dekleva is a Professor at the DePaul University's Kellstadt Graduate School of Business in Chicago. He has over ten years of industrial experience in engineering, systems analysis, and management at IBM and other companies in Slovenia. Besides being on the faculty at DePaul University since 1985, he had taught at the Universities of Iowa, Maribor, and Ljubljana. His papers appeared in journals such as *MIS Quarterly, Information Systems Research, Communications of the ACM, Data Base, Information & Management, Journal of Software Maintenance, Journal of Systems and Software,* and many others. His current research interests include wireless communication technologies and applications, IT management, and valuation of IT investments.

Chengqi Guo is an Assistant Professor and Madison Research Fellow of Computer Information Systems and Management Science in the College of Business at James Madison University. He received his Ph.D. in Business Information Systems from Mississippi State University. He received a Masters of Operations Management and Information Systems from Northern Illinois University and a B.S. in International Marketing from Guangdong University of Foreign Studies, Guangzhou, China. Currently he is also working as a senior consultant at JDArray Co. Ltd. His research interests are Information Systems security, social media, mobile computing (commerce, technical innovation, and social networking service), human computer interaction (adoption, trust, privacy, and communication), innovative technology in education, and cross-cultural studies.

Daniel Mittleman is an Associate Professor in the College of Computing and Digital Media at DePaul University. He teaches coursework in Virtual Collaboration, Social Media, and Social Impact of Technology. He is Program Director for the Atlantis WELD dual-degree program. Dr. Mittleman's research focuses on virtual collaboration technologies and work process. He has spoken on these topics at NASA, The World Bank, the Federal Reserve, NCSA, and multiple Fortune 500 corporations. One of his more notable research projects was aboard the U.S.S. Coronado where he developed the design of several collaborative naval workspaces—and work processes—for the command ship of the Third Fleet. He is currently a Board member of the Institute of Cultural Affairs–USA and past Chair of the Environmental Design Research Association (EDRA). He received the 2009 EDRA Service Award for development of EDRA's virtual presence on the Internet.