

**A RESEARCH FRAMEWORK FOR EVALUATING THE EFFECTIVENESS OF  
IMPLEMENTATIONS OF SOCIAL MEDIA IN HIGHER EDUCATION**

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### **Abstract**

Following the lead of today's hi-tech businesses and industries, many college campuses have begun using Web.2.0 social media technologies like Facebook, blogs, Twitter, and YouTube to facilitate information sharing and collaboration among administrators, faculty, and students. An examination of research on campus social media initiatives revealed that universities are beginning to provide support and infrastructure to support social media initiatives, and that social media tools are being used as part of course content and delivery, where students can use them for collaboration and group decision making on real-world projects. However, much of the research to date was found to be anecdotal, descriptive, and lacking objective evaluation. The paper argues that more rigorous, analytical research is needed to compare and contrast specific features of social media software, the way it is used and implemented, and the outcomes achieved, by students and/or by other stakeholders. To guide future research, the author proposes a research framework that identifies various factors that impact implementations of social media in higher education, as well as relevant outcome variables that should be measured.

### **Introduction**

Many companies have adopted Web 2.0 tools for internal employee communication and collaboration. Web 2.0 tools like Wikis, Facebook, blogs, tagging, LinkedIn, virtual reality, social bookmarking, mashing, rss, podcasts, folksonomies, ePortfolios, chatrooms, and similar technologies, facilitate communication, give participants a feeling of group membership, and are user-friendly. Users can use a web browser for authoring, linking, and tagging; and they can determine how a project will proceed and the form and categories in which content will be structured (McAfee, 2006). Furthermore, Web 2.0 software can enhance knowledge management and expertise location within companies, by serving as an extension of the enterprise directory (Lynch, 2007) that includes details about employees' competencies, project experience and post positions, blogging and bookmark sharing. Web 2.0 software make it easier to harness the firm's knowledge base (Kho, 2007), integrate business functions, provide a platform for collective wisdom, and enable workers to express opinions and collaborate more candidly (Gupta, 2008). Predictions are that enterprise expenditures on Web 2.0 tools will increase significantly in the next five years, reaching up to \$4.6 billion by 2013 (Nairn, 2006; Sinrod, 2007; Young et al., 2008; Perez, 2008).

Given the reported growth of Web 2.0 initiatives in business and industry, it is important that colleges and universities facilitate students' expertise in using Web 2.0 skills for collaboration, group decision making and group authorship, to prepare them to participate in and contribute to Web 2.0 environments when they enter the workforce. The purpose of the current study is to examine ways in which Web 2.0 software is being used in higher education and, based on these findings, suggest a framework to guide future research that identifies the many factors that impact social media implementations and the outcomes that should be measured. Understanding of the way specific social media technologies can be used most effectively can lead to best practices. The paper continues with a discussion of the theoretical foundation for the academic use of Web 2.0 technology and the benefits to be gained—by institutions of higher education, university faculty, and students. Next, examples of prior research on on-campus Web 2.0

software initiatives are examined, followed by presentation of a framework to guide future research.

### **Theoretical Basis for Academic Use of Web 2.0**

The idea of using Web 2.0 tools to enhance learning and communication in academic settings is consistent with current paradigms of education that view the role of the instructor as that of a facilitator of learning rather than as a purveyor or disseminator of knowledge. The constructivist learning theory (Skemp, 1971; Papert, 1980; Siemens, 2004) emphasizes students' active participation in learning, in which they reconstruct knowledge/concepts in terms of their already existing knowledge base and internalize them as part of the learning process. Constructivism emphasizes the social aspect of learning, in which interchange between and among students and instructor impact the internalization of learning. Active Learning theory emphasizes the active engagement of students in activities that involve higher level thinking and evaluation of themselves and others as they complete course-related tasks (Chapman, 2003; Bonwell and Eisen, 1991). Also relevant as a basis for academic use of Web 2.0 is connectivism, a learning theory that emphasizes the impact of technology like hardware, software, and computer networks on the nature of learning and the way information is created, stored, and shared (Siemens, 2004; Couros, 2009.) The following sections of this paper present numerous examples of the way the use of Web 2.0 can revolutionize the learning process, by actively engaging students in collaborative sharing of ideas related to course material, learning from and critiquing each other, and engaging in higher-level thinking that sparks creativity and synergy.

The potential for Web 2.0 tools to facilitate and enhance student learning has been described in numerous articles over the past few years (Alexander, 2006; Nachmias, 2002; Wesch, 2009; Reuben, 2008; McDonald, 2009; Brainard; Oradini and Saunders, 2008; Thompson, 2008; Minocha, 2009).

Specific benefits include:

- Learning-Related Benefits: facilitation of collaborative learning, development of independent learning skills, problem solving, team work, reflective learning, quick/early feedback from instructors, overcoming isolation of geographical distances, peer-to-peer support/feedback, visibility of students' work, integration of multimedia assets, and the creation of informal relations between educators and students.
- Social Benefits for Students: increased engagement in course material, development of a sense of community and of transferable skills that enhance student employability, increased sense of achievement, control, and ownership of their work.
- Benefits for Institutions of Higher Education: increased cross-institutional collaborations, support and community building outside the course environment, development of communities of practice, increased student enrollment and retention.

### **Prior Research on Web 2.0 Initiatives in Higher Education**

The following paragraphs examine on-campus Web 2.0 initiatives at three levels, as suggested by Nachmias (2022). At the macro level is the way technology innovation is introduced in a university, and the amount of types of infrastructure, support, training, and motivation a university administration provides to its faculty to facilitate the diffusion of the technology and its integration into faculty teaching. At the mezzo level is the way instructional processes and instructor-student relations are impacted by faculty integration of innovative technologies like Web 2.0, in terms of factors like time/space considerations, information and content, communication and interaction, instructor/student roles and relationships, and pedagogical methods. Third, at the micro level, are case studies that detail descriptions and logs

of specific implementations of Web 2.0 technology in college courses, with particular focus on the successes and difficulties students and faculty experienced and their assessment of the effectiveness/impact of the technology on communication, collaboration, and learning.

### **Macro Level Initiatives:**

The academic social media literature includes a number of descriptions of university-wide Facebooks and networks featuring video, blogs, and podcasts (Johnson, 2008; Purdue University News, November 2, 2009; PR Newswire, 2010; Franklin and van Harmelen 2007); the use of Twitter and YouTube to share information about student/faculty expertise and accomplishments (Lavrusik, 2009); enterprise-wide services like WorkPress (Bonnett, 2010); and a Web 2.0 wiki repository (INSITE, 2010). However, most of what is written about these campus social media initiatives is from the viewpoint of the university itself or from what was gleaned about the initiative by the author.

Minocha (2009), on the other hand, used a carefully structured case study method to examine several university-level Web 2.0 initiatives in the United Kingdom. Researchers were trained to use scripts as they interviewed university officials, faculty, and students about their experiences with using various types of social media software-- open source Elgg social network for recruitment, social, and instructional purposes at the University of Brighton; the University of Bradford's Ning online social network site for staff, and new/potential; the University of Westminster's UK's upgrade of its online network with the Connect system to provide personal and community blogs and file storage, tagging, private and public communities, and social networking capabilities; the Open University's FirstClass Conferencing discussion forums and Elluminate web conferencing capabilities to enhance communication in distance education courses; the University of London's use of a Facebook account to interact with students about how to upgrade its library facilities; and the University of Edinburgh, Scotland's use of blogs and rss, social bookmarking technologies that link course reading lists with library resources, downloadable lecture podcasts, and a Frappr mashup application to facilitate communication between international students.

### **Mezza Level Initiatives:**

The literature for research at the mezza level also includes numerous descriptions of the use of Web 2.0 social media tools, written from the perspective of the faculty who used them: a library presence embedded in a course using Web 2.0 tools like Second Life and YouTube at Purdue University (Evans, 2009); Boston College's use of Socialtext wikis, to enhance communication and collaboration in an introductory Management course (Brainard); an Indiana University lecturer's use of Twitter to keep in touch with students (*IU News Room*, September 25, 2008, 2); Anderson University's instructional use of YouTube videos to enhance classroom lectures, online discussion forums, and ebooks, podcasts, and online articles for reading assignments (Johnson, 2008); and integrations of social media courses at business schools at Harvard and Columbia, the London Business Scholl, and INSEAD (Saadi, 2010).

Several more rigorous studies have examined student attitudes and outcomes. Rienzo and Han (2009) compared implementations of Microsoft Office Live and Google Groups, Docs, and Sites in the Introduction to Business Computing course at Western Michigan University. Students found that, although both software support online shared documents, Google docs is better when simultaneous editing is required, while Microsoft Office Live is easier to use when a large number of files must be shared. They also remarked that the software created a sense of connectivity to the course and to each other. Dunlap and Lowenthal (2009) described how Twitter was used in online instructional design and technology courses. Students benefited from

learning to share task-related queries and thoughts on Twitter, practiced writing concise thoughts, developed sensitivity to one's audience, and connected with practitioners in their field. Levy and Hadar (2010) studied MBA students' use of a social networking site based on the Ning platform. Over a semester, students managed a personal profile, wrote in personal blogs, posted messages to discussion forums, and reacted to other students' postings. Levy and Hadar found that most students had been unfamiliar with this technology, but at the end of the semester, realized the benefits and potential of the technology. Lending (2010) gave students in an Introductory Management Information Systems course the assignment of creating a final exam study guide, using Microsoft Sharepoint collaborative technology. They were required to participate in a wiki every few days, create new wiki pages on topics of their choice, and revise and edit another student's content. Some students complained about the tediousness of the assignment, but many others felt that participation in the Wiki helped them feel closer to other students and reinforced classroom learning.

### **Micro Level Initiatives:**

Literature at the micro level includes more examples of more rigorous investigations that measured student/instructor outcomes and experiences with particular software.

In fall, 2008, IU Kelley School of Business' executive education program launched a virtual campus initiative in which courses are delivered on Second Life, an Internet-based 3-D virtual world created by its residents (*BizEd*, November/December, 2008; *IU News Room*, September 9, 2008).. A "Managing the Services Lifecycle" course at the Kelly School and at the Jenkins Graduate School of Management at North Carolina State University involved students in the use of collaborative tools (including wikis, blogs, and multiuser 3D virtual worlds) that facilitate multidisciplinary or cross-functional coordination of expertise and knowledge sharing in the enterprise innovation process (Massey and Montoya, 2008; *IU News Room*, June 9, 2008). Course designers realized that, given increasing use of Web 2.0 and virtual world technologies in the business world, employment opportunities are increasing for graduates who have the expertise to use them. Massey and Montoya reported that Second Life facilitated collaboration and the development of effective relationships and "rich real-time communication" among geographically dispersed team members. A Jenkins School student, remarked: "I can definitely see possibilities for use of this new technology [Second Life] in education and by my company. It's more interactive and engages us in a different way" (Massey and Montoya, 2008, p. 2) IU student Linda Rasmussen said, "I have discovered a lot about what kinds of technologies provide value. I have already shared my team's business case with my current employer's training department to get them thinking about the advantages" (Massey and Montoya, 2008, p. 2). Students also said that Second Life helped them develop working relationships and that wikis and document repositories facilitated writing, editing, sharing, and storing project-related documents.

Williams and Chinn (2009) involved students in a sports management course in the development of an online marketing campaign to increase attendance at athletic games. They created website, blogs, discussion threads, YouTube videos, used Facebook, LinkedIn and My Space pages, groups, invitations, and Freewebs to collect data on page views, poll activity levels, and time spent on the page. The instructors remarked that this assignment gave tech-savvy students an opportunity to apply and extend their skills to a real-world scenario. Student online discussions showed critical analysis, reflection, and evaluation, and an understanding of the challenges businesses face in using Web 2.0 tools. Braender, Kapp and Years (2009), at the School of Business at the College of New Jersey, used WordPress to develop a blogging site, to

engage students in discussion and contemplation about social, legal, and ethical effects of the Internet on society. The authors found that students were much more open in expressing their opinions than in traditional classroom settings. Students were also highly critical of each others' postings and did not know much about computer security. Couros (2009) developed an open, connected, social graduate course in educational technology in which students developed a personal blog/electronic portfolio to document learning, critique course readings and activities, and record personal thoughts about the course; collaborated to create a wiki resource; and produced a digital project. One student said this was a "profound professional development experience" that made her aware of the importance of being connected and changed her concept of education (Couros, 2009, 6). Another student said that she had become "a networked learner" (Couros, 2009, 6). Yue et al. (2009) described development of a social network site as a capstone project by graduate information systems and computer science at the University of Houston-Clear Lake. The site was developed for a swim team, using components of Joomla Content Management Software, to enable swimmers to create personal spaces to post goals, videos, photos, blogs, and discuss training techniques. Coaches could provide training information and parents could send encouraging messages and keep updated on their children's swim team activities. Students reported liking Joomla's predefined framework, being able to develop and extend plug-ins that required minimal technical maintenance, and developing a real-world web 2.0 application.

Minocha (2009) conducted twenty case studies that ran for more than one semester and collected feedback via questionnaires with educators and students and journals regarding the value of the social computing tools they used. The case studies covered the use of Web 2.0 tools that included discussion forums, wikis, blogs, podcasts, microblogging or Twitter, photo-sharing (Flickr), Google Earth, 3-D virtual worlds, web conferencing, social networking sites like Facebook, and others based on Elgg and Ning. Studies were conducted in a wide range of disciplines and levels of study (undergraduate, post-graduate, vocational, part-time, full-time), conducted in face-to-face, face-to-face and online learning, and distance-education settings. The study provides insights about pedagogical reasons for introducing Web 2.0; internal and external drivers that impact a university's adoption of social computing tools; benefits for students, educators, and institutions; and challenges and issues regarding the use of Web 2.0. Results highlights include the facilitation Web 2.0 tools give for the sharing of resources, collaborative learning, problem-based, inquiry-based, peer-to-peer and reflective learning. Students develop vital transferable skills like team work, online collaboration, negotiation, and communication, and digital identity management. Some students find that the sharing and collaboration made possible with Web 2.0 add to the amount of workload related to coursework, and that they worry about privacy issues related to the public aspect of the tools they used for course activities. Faculty reported that Web 2.0 software resulted in their moving from the role of information provider to that of facilitator of learning, and that they felt the need for training for this new role and consideration for workload issues.

### **Conclusions and Proposed Research Framework**

The above discussion has presented examples of the way colleges and universities are using Web 2.0 tools to enhance student learning, research, and communication and, ultimately, to prepare students for the types of work they will do in today's hi-tech workplace.

The authors found that Web 2.0 tools are being used as part of course content and delivery, where students can use them for collaboration and group decision making on real-world projects with students all around the world; and a number of universities are taking steps to provide the

infrastructure and support necessary to make such initiatives possible. However, as was mentioned above, much of the research to date, particularly at the macro and mezzo levels, is anecdotal, descriptive, and lacks real analysis of outcomes achieved. Rigorous, analytical research is needed that compares and contrasts specific features of social media software, the way it is used and implemented, and the outcomes achieved, by students and/or by other stakeholders.

**Table 1: Research Framework for Evaluating Web 2.0 Initiatives in Higher Education**

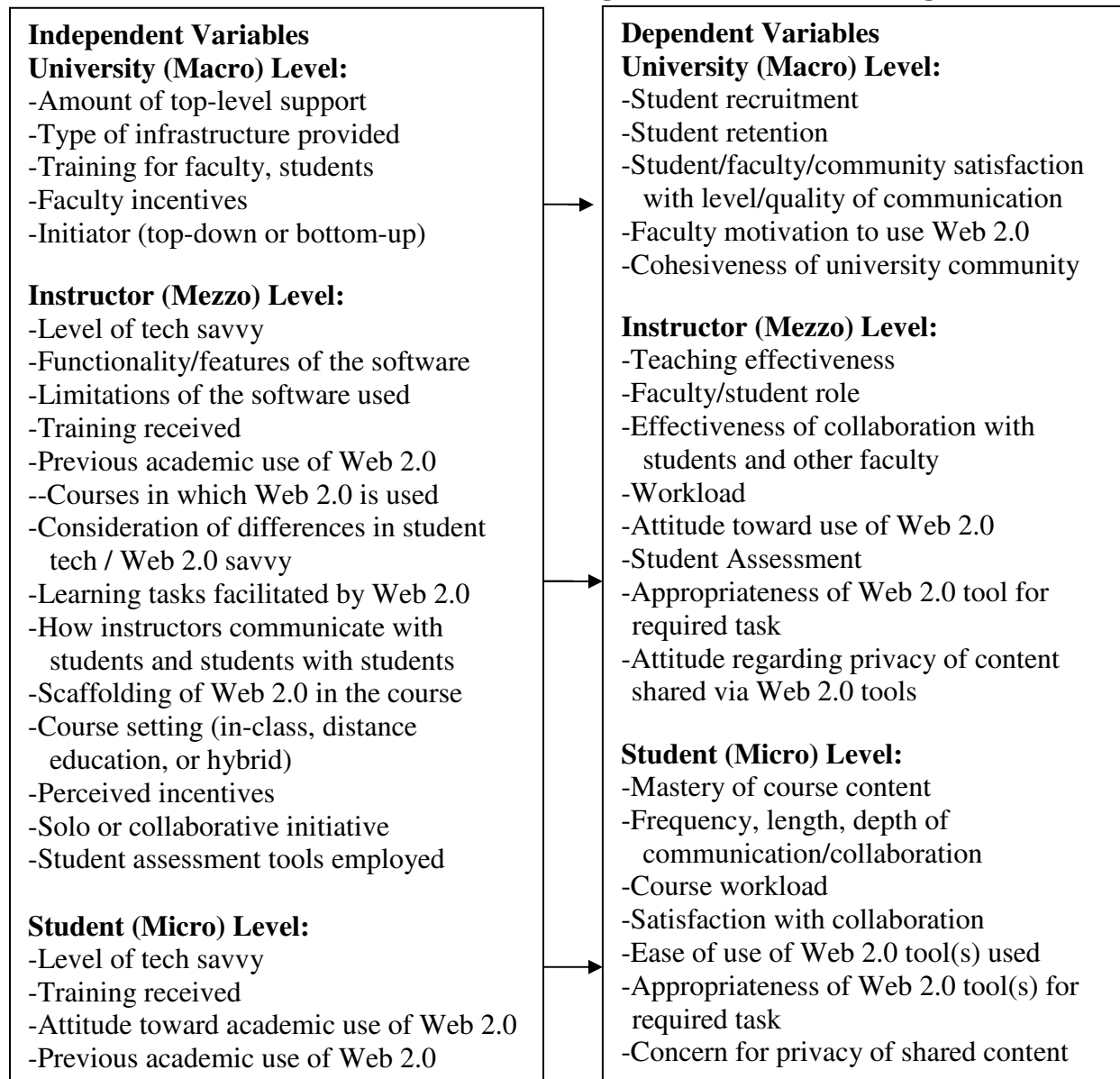


Table 1 presents a proposal for a framework to guide research on campus Web 2.0 initiatives. Based on findings from previous research, the framework identifies variables that impact Web 2.0 initiatives at the macro, mezzo, and micro levels and the types of outcome (dependent) variables that are in need of investigation. Researchers can choose the specific independent variables that interest them and study their effect on particular outcome (dependent) variables. Such investigations will shed light on the impact of Web 2.0, at the university, faculty, and student level, and will determine factors that can help ensure the effectiveness of Web 2.0 initiatives.

Research at the macro level would focus on the way technology innovation is introduced in a university, and the amount of types of infrastructure, training, and motivation the administration provides to faculty to facilitate the diffusion of the technology and its integration into teaching (Nachmias, 2002). For example, researchers could examine the impact of the availability/lack of faculty incentives and training on satisfaction with the level and quality of communication via social media and faculty motivation to use it. Investigations at the macro level should take into account the fact that technology diffusion is not always a top-down effort. Sometimes, individual faculty who have a special interest and expertise in innovative instructional technologies integrate them into their coursework (Hamid, Chang and Kurnia, 2009). Such individuals can serve as champions for these efforts and effect change at top levels of a university. Thompson (2008) characterizes the role of Web 2.0 technologies on college campuses as that of a disruptive technology, since it requires a university, its faculty, and students to rethink and restructure the learning process in order to effect the change the technology requires in order to be used effectively. Thompson also points out that universities are finding that adopting Web 2.0 is necessary to remain competitive, and that universities who do will achieve a “Starbucks Effect,” in which they will attract students away from other universities who cannot offer students these experiences. Accordingly, the impact on student retention (Minocha, 2009) and recruitment are important aspects to investigate, as are student/faculty/community satisfaction with the level/quality of communication and interaction made possible by university Web 2.0 initiatives and the impact on the cohesiveness of the university community, including students, faculty, alumni/alumnae (Minocha, 2009).

The focus of research at the mezzo level would be the way instructional processes and instructor-student relations are impacted by faculty integration of innovative technologies like Web 2.0, in terms of several factors. For example, researchers could study the impact of course setting (in-class, distance education, or hybrid) on faculty workload and the effectiveness of faculty communication and collaboration with students (Braener, 2009). At the mezzo level, researchers could also examine decisions faculty make regarding how to scaffold Web 2.0 technology into the course (Redecker, Al-Mutka, and Punie), how both Web 2.0 tools and content will be available to students, which course-related tasks can be effectively facilitated by the technology (Hamid, Chang, and Kurnia, 2009), how they will communicate with students and students with students, how the remote/asynchronous environment associated with the use of Web 2.0 tools will impact student learning (Dunlap and Lowenthal, 2009), and how to structure the coursework to take into account differences in student familiarity with and attitudes toward Web 2.0 tools (Redecker, Al-Mutka, and Punie; Hamid, Chang and Kurnia, 2009). The impact of the functionality, features and limitations of particular software is also in need of investigation. (Redecker, Al-Mutka, and Punie; Rienzo and Han, 2009; and Williams and Chinn, 2009). Other factors include the impact of the technology on roles and relationships— instructor to student, student to student, and student to other sources of expertise; the instructor’s perceived



incentives/motivation for Web 2.0 initiatives (Nachmias, 2002); instructor's tech savvy and experience with Web 2.0 tools in an academic setting; and whether this is a solo initiative or a collaborative effort among faculty. Research should examine the impact on student collaboration and learning, faculty workload, privacy issues related to online communications (Minocha, 2009), and the effectiveness of assessing student participation and performance (Minocha, 2009).

Third, at the micro level, research should include case studies that detail descriptions and log specific implementations of Web 2.0 in college courses, with particular attention to the successes and difficulties students and faculty experienced and faculty/student assessments of the effectiveness/impact of the technology on communication, collaboration, and learning (Nachmias, 2002). For example, researchers could study the impact of students' level of social media savvy (Redecker, Al-Mutka, and Punie), on their perceived satisfaction with the collaboration facilitated by social media (Williams and Chinn, 2009) and their mastery of course content. Research at the micro level could focus on attitudes/expectations for the use of Web 2.0 in the course, and the training/orientation they are provided (Redecker, Al-Mutka, and Punie). Measurements should be made of student course content mastery; course workload; the frequency/length/depth of communications and collaborations among students, the instructor, and outside experts consulted (Rienzo and Han, 2009; Lending, 2010); ease of use of Web 2.0 tools, their appropriateness for the required task or tasks, and privacy issues related to sharing content and opinions via Web 2.0 tools (Minocha, 2009).

With predictions that Web 2.0 will continue to grow in importance as a valuable tool for enhancing employee collaboration and knowledge sharing, universities will, hopefully, increase efforts to provide their students with the skills and knowledge they need to use these new technologies effectively when they enter the workplace. The research framework proposed in this paper will facilitate the identification and analysis of factors that impact the success of on-campus Web 2.0 initiatives, and will provide insights that are useful as increasing numbers of universities adopt social media.

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