

Using a Wiki-Based Course Design to Create a Student-Centered Learning Environment: Strategies and Lessons

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ABSTRACT

As public administration programs increase their proportion of online and hybrid course offerings, online course offerings must provide a unique value to maintain a high-quality education instead of simply repackaging content designed for traditional face-to-face environments. Well-designed online courses can provide unique advantages for student-centered learning. Furthermore, the role of technology and information management in government practice will consistently increase. For pedagogical purposes and for better preparing students to work in collaborative networked environments, public administration programs need to train students to be comfortable with emerging technologies and ideally lead innovation in their applications. Emerging technologies have demonstrated great potential for crowdsourcing a wide variety of socially beneficial activities and for empowering and engaging students in collaboration. This study reflects on 4 years of continuous efforts to design, create, teach, and improve a wiki-based online course, called ePublic Affairs, intended for MPA, MPP, and PhD students. This case study of a wiki-based course in fall semester 2010 discusses in depth how a wiki-based course can use a wide range of emerging information technology tools to create engaging online learning modules and to empower students through various innovative class activities. This wiki-based course shows that a well-designed online course can encourage equitable and quality participation as well as provide flexibility for students' learning, addressing many concerns with online courses. This paper also highlights the unique challenges that were unanticipated in the earlier iterations of the wiki-based course.

Online teaching systems and tools are no longer a novelty in most public affairs and public administration programs (Brower & Klay, 2000). Since the 1990s, online education has gained popularity in public administration programs due to its easy access and great flexibility for students to learn at their own pace and time (Stowers, 1999). A decade later, various emerging social media technology tools have been introduced to both traditional classrooms and online teaching (Wankel, Marovich, & Stanaityte, 2010).

One particular category of technology that is permeating all walks of life, including public administration, is social media. Social media is “a group of Internet-based applications” that “allow creation and exchange of User Generated Content” (Kaplan & Haenlein, 2010, p. 61). Broadly speaking, social media refers to technologies that can facilitate social interaction, collaboration, and deliberation (Bryer & Zavattaro, 2011). Examples of social media include wikis, blogs, and social networking sites such as LinkedIn, Facebook, Twitter, and virtual worlds like Second Life. Social media tools, due to their great potential for student engagement and empowerment (Wankel et al., 2010), deserve more scholarly research and innovative application in teaching.

This study focuses on how wikis can be used to create a student-centered collaborative learning environment. Wikis are software-based hypertextual web pages that support content creation, revision, and redistribution by Internet users (Buffa & Gandon, 2006; Mergel, 2010). The increasing use of information technology in government practice makes it imperative for public administration programs to become familiar with the strengths and weaknesses of emerging information technologies so as to better prepare students to work in a networked society. There has been an increasing use of wikis and other types of social media in industry (Farrell, 2006) and government for information sharing and collaboration (Mergel, 2010; Noveck, 2009). More studies are needed to better understand the potential role and impact of social media for public administration education. Although there are a few studies on the technical aspects of wikis in other disciplines (Ruth & Houghton, 2009), pedagogical requirements (Wang & Turner, 2004), and use of various social media tools in classrooms in general (Bryer & Chen, 2010), relatively few studies in public administration education have systematically investigated the pedagogical implications of wikis as the platform for creating a student-centered learning environment.

Although online teaching systems start to support the most current social media tools, the actual use of social media is far from guaranteed. To incorporate these new tools constructively into course designs, lessons from the case of a wiki-based learning environment can help transform traditional online interactions between instructors and students, empower students, and encourage students' deliberation. This study reflects on 4 years of continuous efforts to design, create, teach, and improve the wiki-based course titled ePublic Affairs:

The Use of Information for Public Administration Professionals, offered to Masters of Public Administration (MPA), Masters of Public Policy (MPP), and PhD students in Public Administration. Using a detailed analysis of this course in fall semester 2010 as a case, this study discusses in depth how a wiki-based course can use a wide range of emerging information technology tools to create engaging online learning modules and to empower students through various innovative class activities. This wiki-based course shows that a well-designed online course can encourage quality participation, provide flexibility for students' learning, create experiential learning in a wide variety of technologies, transform the roles students conventionally play in classrooms, and allow for instant and multidimensional feedback. This wiki-based course has also presented unique challenges that were unanticipated in its earlier iterations. Specifically, this paper explores the challenges of providing additional training, tracking students' progress, and promoting collaborative group work. Overall, there is great potential for using wikis to encourage instructors and students to co-create and develop the uniquely valuable collaborative learning environment.

LITERATURE REVIEW

This section begins by reviewing challenges existing in traditional online education and then discusses what wikis are and how wiki-based learning environments differ from the traditional online learning environment.

As early as the 1990s, scholars systematically examined the issues, advantages, and disadvantages of online public administration education (Ebdon, 1999; Leip, 1999; Mingus, 1999; Rahm, Reed, & Rydl, 1999; Stowers, 1999). The rapid development of web technologies provides students with easy access to online courses and great flexibility (Brower & Klay, 2000; Stowers, 1999). Online courses can overcome the constraints of time and geographic distance and allow students to learn at their own pace and schedule (Brower & Klay, 2000; deLeon, 2000). In addition, the Internet-mediated learning environment can provide students with multiple sources of information (websites, discussion boards, online modules, etc.), compared with the traditional lecture-dominant classroom (Rahm et al., 1999).

However, scholars have raised concerns about online education (Brower & Klay, 2000; Campbell, 2006; Rahm et al., 1999; Stowers, 1999). One common concern is whether quality interactions can be successfully pursued between students and the instructor, among students, and between students and the course content (Garrison, 2005; Moore, 1989). On the one hand, web-based courses can reduce the impacts of status cues on students' participation in online discussions and other learning activities (Stowers, 1999). On the other hand, due to the lack of face-to-face communication, online education does not afford a sufficient level of social dimensions that can "encourage attitudinal changes, or affirmation of existing values, to provide a normative compass to guide

subsequent behavior” (Brower & Klay, 2000, p. 218). In other words, the lack of social cues may hinder online education from providing the social context for students’ development of value-based competencies (Brower & Klay, 2000). The traditional online learning environment facilitates content delivery and has not focused much on empowering students and encouraging participatory engagement (Ruth, 2002). Can emerging interactive technologies provide solutions to address these existing challenges in online education?

Emerging forms of interactive technologies seem to have demonstrated great potential for engaging and empowering students in innovative ways (Bryer & Chen, 2010). Recent years have witnessed the rapid advances and great potential of Web 2.0 and social media technology, characterized by “peer production,” “open source and open context,” “user-centered innovation,” “crowdsourcing,” and “task granularity” (Mergel, Schweik, & Fountain, 2009, pp. 9–16). The potential transformative power of Web 2.0 and social media technology lie in “the ease in which interactive collaboration can occur between organizations or between individuals with very limited technical know-how” (Mergel et al., 2009, p. 30). This new generation of information technology allows the users more freedom to create the content and collaborate with each other in a variety of forms and media. With the rapid advancement of emerging interactive technologies, it is possible to go beyond using online environment as the facilitative content delivery mechanisms to create a student-centered participatory learning platform (Ruth, 2002; Ruth & Houghton, 2009).

Two external forces drive the efforts to explore innovative ways of using interactive technologies for public administration education. First, given the ubiquity of information technology in government management practice, it is important to provide structured experiences with emerging technologies and to build information strategy and management into public administration curriculum (Dawes, 2004; Kim & Layne, 2001). Second, endeavors to explore new platforms for engaging students in learning are also driven by the demand of the millennial generation of students. According to the study conducted by the Pew Research Center in 2010, approximately 53% of American Internet users search information on Wikipedia as of May 2010 (Zickuhr & Rainie, 2011, p. 2). There are currently over 800 million active Facebook users (Vitak, Lampe, Ellison, & Gray, 2012), among which the young adults aged 18 to 25 total 50 million and account for 35% of the total Facebook users (Burbary, 2011). The millennial generation of students are using these emerging technologies in their daily life and study (Ellison, Steinfield, & Lampe, 2007). Hence, public administration educators need to explore innovative platforms to engage students with in-class activities and out-of-class communication (Ellison et al., 2007; Ruben, 1999).

What Is a Wiki? Definitions and Applications in Public Services

Among the wide range of interactive technologies, wikis are websites on which content can be created, edited, and shared by users (Mergel, 2010; O' Neill, 2005). First created by Ward Cunningham in 1995 as a user-friendly editing tool that allows publishing the output on the Internet (Leuf & Cunningham, 2001), wikis are collaborative platforms designed to encourage content and information sharing (O'Neil, 2005). Users can create an account, write on topics of interest, edit their own or others' work, and review the history of edits. A well-known example of wikis is Wikipedia, an online encyclopedia in which millions of individuals across the globe volunteer to create, edit, and update descriptions of various topics (Elgort, Smith, & Toland, 2008). After the wiki page is created, the page is open to the world for edits, updates, and deletion (Mergel, 2010).

Wikis have found wider applications in government. The federal government has increasingly used social networking initiatives to engage the public in solving complex social problems (Noveck, 2009). Federal, state, and local governments have used wikis as collaborative platforms to share information and encourage collaboration internally within the organization, across the organizations, and with the general public (Mergel, 2010). For instance, the General Services Administration (GSA) of the federal government launched the BetterBuy Wiki to engage general government employees, contracting managers, project managers, private business stakeholders, and citizens in the collaborative efforts to improve the federal acquisition process (Mergel, 2010). The purpose of this wiki space is to transform the government procurement process into one that is efficient, effective, and transparent (Mergel, 2010). In short, the increasing use of wikis in government practice has made it necessary for public administration programs to expose students to the potential of wikis for educational purposes and afford them experience in the creation and use of wikis.

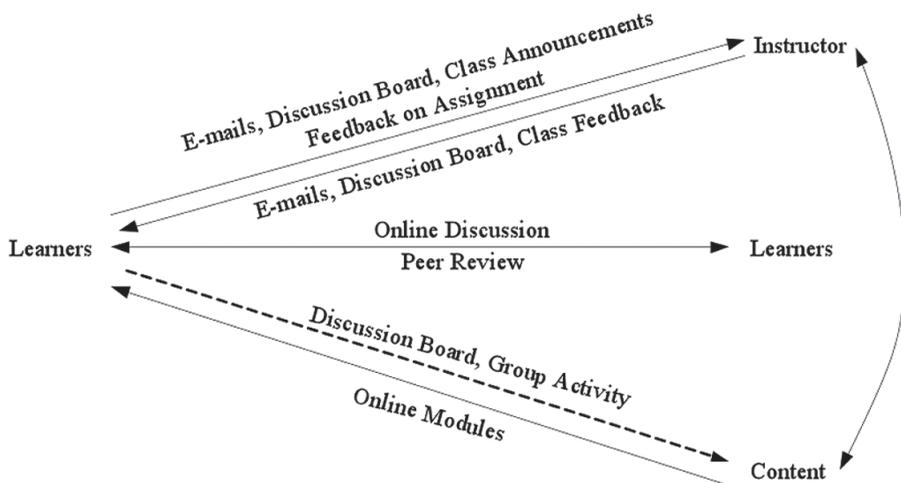
Wiki: A Participatory and Collaborative Learning Platform

In the field of instructional technology, studies have shown the uniqueness of using wikis as the platform for knowledge co-creation and development (Ruth & Houghton, 2009), for group work (Chao, 2007), for fostering group interactions, and for "collaborative, egalitarian learning" (Elgort et al., 2008). With features that include simplicity, flexibility (Reinhold, 2006), and open editing (Leuf & Cunningham, 2001), wikis distinguish themselves from the traditional course delivery system that does not support newest social media tools (Elgort et al., 2008). On the wiki platform, users can visit a wiki, create a wiki, edit, or even delete a wiki easily and as frequently as they like (Thomas, King, & Minocha, 2009). All users can have the same right to access and make changes to the wiki anytime using the web browser (Thomas et al., 2009). The structure of the wiki and links to the wiki can be decided on and changed by

users (Thomas et al., 2009). When these features of wikis are incorporated into the online course design, students can assume a more active role in the course content by creating and editing the wiki course page, and they can use the wiki to collaborate with other classmates on course projects. In other words, these wiki features can encourage students' contribution to course development, knowledge sharing, and group project facilitation (Thomas et al., 2009; Ruth & Houghton, 2009).

The following section details the attributes of the wiki-based learning environment by comparing the wiki-based learning environment with the traditional online learning environments that do not support the wiki component. Moore (1989) assumed that three types of interactions are needed to be encouraged in online learning: (a) learner-to-instructor interactions, (b) learner-to-learner interactions, and (c) learner-to-content interactions. As seen in Figure 1, learners in a traditional online learning environment interact with the instructor mainly through e-mails, raising questions on the discussion board and providing class feedback. Instructors interact with students by sending class e-mails, making announcements, posting online modules, giving assignment feedback, and asking for feedback at a fixed time such as at mid-semester or the end of the semester. Learners interact with each other through group activities or peer-review processes. The relationship between learners and content is shown by one solid line and one dotted line to indicate that although learners read and reflect on the online course content provided by the instructor, learners seldom make changes or updates to the online course content.

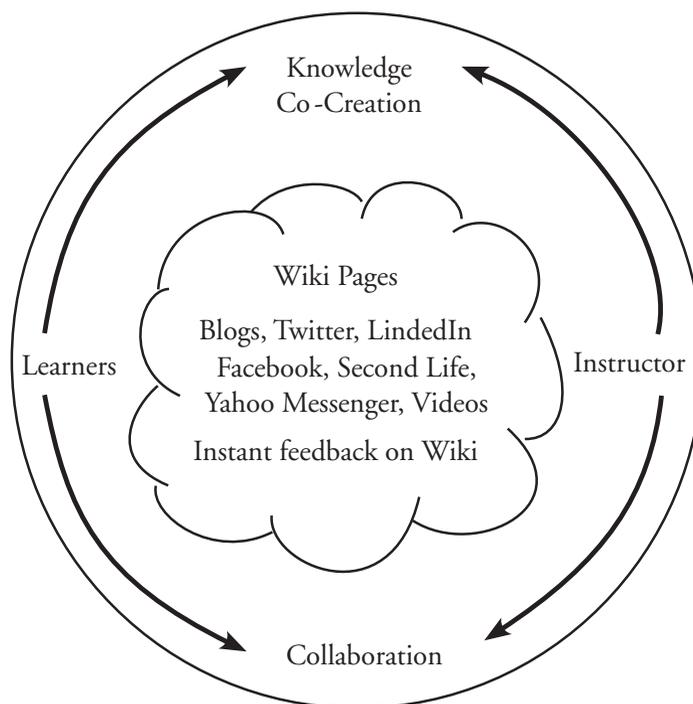
Figure 1.
Traditional Online Learning Environment



By comparison, the wiki-supported course can transform the interaction patterns that exist in the traditional online learning environment. As Figure 2 shows, students have a variety of ways of interacting with the instructor, other students, and course materials. Wikis can be used to create a participatory and collaborative learning platform for students (Ruth & Houghton, 2009). Compared to traditional online courses that do not have a wiki component or other similar online collaborative platform, the wiki-based course design has its strengths in creating a collaborative learning environment for knowledge co-creation and for encouraging communication and collaboration.

Figure 2.

Wiki-Based Collaborative Learning Environment



Enabling co-design and co-creation of the course. With regard to student-to-content interactions in the wiki-supported learning environment, students can participate in creating and revising the course content rather than being receivers of passive knowledge (Ruth & Houghton, 2009). In a traditional online course, instructors post the course syllabus, provide supplemental course materials, and set up the structure and outlook of the course (Elgort et al., 2008). By contrast, wikis are well suited to engage students in creating course content and providing instant feedback to the instructor. Students and instructors can work together to

design the course. Therefore, students can be given a certain level of control over the structure and content of the course. The course wiki grows with students' collaborative contribution (Thomas et al., 2009). In addition, the ease-of-use attributes of wikis can make the editing experience appealing to the digital generation (Wheeler, Yeomans, & Wheeler, 2008).

Evolving the student-to-instructor interactions. "Sharing of authority" encourage students to take active roles and become part of collaborative efforts in building course content (Ruth & Houghton, 2009). The development of the course becomes an ongoing collaborative project between the instructor and students. Compared with many traditional online learning environments, the wiki-based learning environment can reduce the feedback loop by creating a wiki page and asking students to provide feedback at any time throughout the entire course, rather than seeking feedback at the end of the module or at the end of class. Besides, students were given multiple communication tools to contact the instructor when needed. Going beyond sending e-mails and posting questions on the discussion board, students can choose to post a message on their Facebook page, send instant messages, post their reflections on their blogs, or send a tweet to the instructor, depending on their communication needs. Hence, dynamic interactions between the instructor and students can occur both within the wiki space as well as outside the wiki space.

Building a collaborative learning community. Scholars expressed concern that online education lacks the social context and cues inherent in face-to-face education that is imperative to facilitate quality participation and collaboration (Brower & Klay, 2000). The wiki-based learning environment can help overcome this problem by building social relationships between students as well as between students and instructors (Coutinho & Bottentuit Jr., 2007; Schroeder, Minocha, & Schneider, 2010), strengthening social ties (Wheeler et al., 2008), and developing a "community of practice" by constant sharing and reflection (Wheeler et al., 2008). Students' individual contributions on the wiki page can trigger feedback and critiques from other fellow students, invite others' contributions, and further inspire critical thinking; these activities are crucial to the development of a collaborative learning environment (Schroeder, Minocha, & Schneider, 2010). When the wiki is used for student coursework, students understand that their work is visible to everyone in the class. A shared norm of quality is quickly created. Social accountabilities tend to encourage higher-quality work. Additionally, by reviewing the exemplars in course performance each week, students are quickly able to gauge the quality of their performance with stellar students and have another feedback loop highlighting the differences between their work and what can be accomplished (Schroeder et al., 2010). This social learning environment reduces the times students ask for their assignments to be reevaluated and socially motivates students to regularly produce high-quality work. The wiki is also a permanent community space that exists as a centralized knowledge repository for sharing coursework and examples and can exist well after the semester concludes.

Challenges. The development of the course wiki has its unique challenges (Thomas et al., 2009). Building the wiki platform can be time-consuming (Wheeler et al., 2008). Although the wiki space is free and easy to use, the instructor still needs to train students at the beginning of the class and answer additional wiki-related concerns throughout the class. Furthermore, the open and transparent participation of the course wiki cannot guarantee the success of group projects and an equal level of contribution (Elgort et al., 2008). Without thoughtful course design, the pattern of students' participation may again fall into group dynamics pitfalls such as free riding and groupthink. Hence, the instructor needs to explore and develop the proper assessment tools in the wiki course so that not only the final collaborative product but also the individual contribution can be rigorously evaluated (Ben-Zvi, 2007; Trentin, 2009). The well-designed evaluation component can promote academic integrity and reduce plagiarizing.

CASE: ePUBLIC ADMINISTRATION COURSE

The course titled ePublic Affairs: The Use of Information for Public Administration Professionals has been offered as an elective for MPA, MPP, and PhD students in the School of Public Affairs at Arizona State University for four fall semesters from 2008 to 2011. This course is designed for students to collaboratively explore and understand how information technology tools influence the way people interact, work, and serve—and more important, how IT can serve as the platform to make government more transparent, participatory, and collaborative. This course purports to familiarize students with current information management issues (privacy, equal access, transparency, governance, etc.) and contextualizes these information management issues in local government management and public service delivery. This course has been offered exclusively on Wikispaces, a free and advertisement-free wiki platform that provides education-specific pages that are private to members and easily edited (Jakes, 2006). This course incorporated a number of additional social media tools including blogs, Facebook, Google+, Twitter, virtual worlds (Second Life), check-in technologies (Foursquare), and instant messengers (Yahoo) in addition to traditional online teaching and communication tools such as videos and class e-mails. With a strong belief in learning by doing, students were expected not only to learn information management and relevant policy issues, but also to learn how to use new information technology tools and how to overcome the barriers that prevent people from learning these technologies. The course was composed of eight 2-week modules. The first module was dedicated to getting oriented and served as a process check that the students knew how to use the technologies essential for the course. The other modules centered on topics including Theory, eCommunities, Open Government, eParticipation, Ethics, Challenge Platforms, and Policy Informatics. Like many online courses, each module provided guided readings, specific activities to complete, and the responsibility to react to and interact with other students. Each week students read the online modules and required readings, explored technologies, applied ePublic Administration technologies and concepts to current challenges in public administration, built course content, and provided feedback to other students.

This wiki-based course differs from most online courses in several aspects. First, it asked students to engage in creating course content together. On the home page of this course, it emphasized that contributing to and modifying the course wiki pages is a central part of the course. To reinforce this focus, a sizable portion of the class grade was designated to community-building activities. These activities included commenting on other students' content, adding examples to the wiki, providing relevant stories on a shared Google+ circle, and offering any other type of contribution that improved the educational community. For each module, students wrote reflections on the readings and videos, posting them to their blogs and wiki pages so that other students could review and comment on their posts. Students' writings automatically became part of the course content that supplemented the existing online modules. For instance, all students were asked to sign up and read separate chapters of the book, *Code 2.0 and Other Laws of Cyberspace*. Then, in teams of 2–3 students, they wrote a chapter review and critique on the wiki page; these writings became part of the course content. Over one week, this crowdsourced and coordinated effort of the student teams provided a full review of the book that was accessible to the entire class.

Second, this class used the wiki platform to assign another crowdsourcing activity requiring the creation of a single wiki paper whose topic and content were devised and developed through the collective means of the students and for which they all earned the same grade. In fall 2010, all 17 students wrote one paper together that created a plan for governments to apply ePublic administration concepts to building relationships with the general public to cultivate sustainable citizen participation in public affairs. In the module following the wiki paper assignment, students reflected on this process of crowdsourcing.

Lastly, the course offered a shared place for students to provide anonymous feedback throughout the semester rather than requesting feedback at certain times or at the end of the semester. Feedback from the same course from previous years as well as constructive responses to the feedback were also shared with students.

RESEARCH QUESTIONS AND METHODS

In analyzing this wiki course in depth, the ensuing section of this paper addresses whether the wiki-based learning environment can encourage student participation, enhance student learning, and foster collaboration among students—and if so, to what extent? This section also discusses the challenges encountered in designing and teaching this wiki-based course.

There were three main sources of data collection. The first data source is the course wiki itself and all the activities that occurred during the class in fall 2010, including the blog posts and class project. The second source of information was students' reflections on the course content throughout the semester. Students were asked to write feedback and comments to the class on a wiki page. The third data source came from the formal class evaluation conducted by the School of Public Affairs at Arizona State University at the end of the fall semester.

Data on using various wiki features was also collected through wiki history that documented students' views and edits. Analysis of both qualitative and quantitative data is provided in the following section.

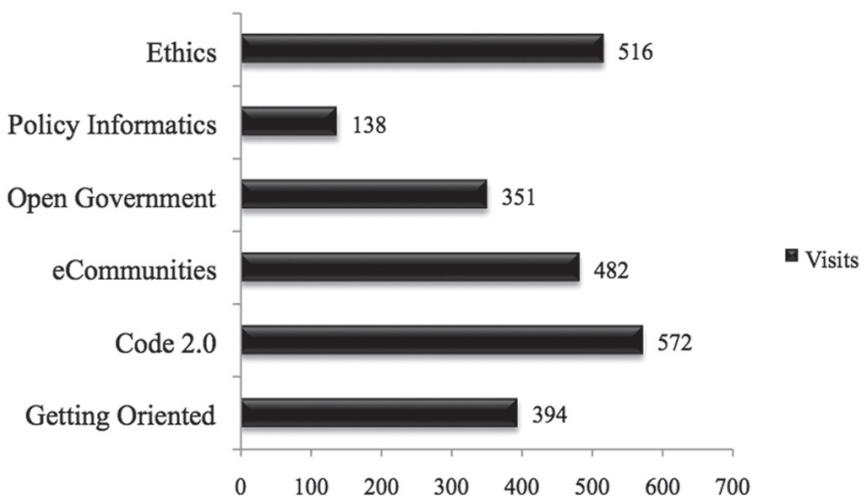
RESULTS AND DISCUSSION

The class size for the course ranged from 17 to 25 students in the fall semesters of 2008, 2009, 2010, and 2011. Most of the following descriptive analysis focuses on the course offered in fall semester 2010. The ensuing analysis starts with the descriptive statistics on wiki course visits and edits, and reports on the learning outcomes of the wiki course. This end of this section also includes some general reflections on teaching this course over the past 4 years.

Content Editing and Visits

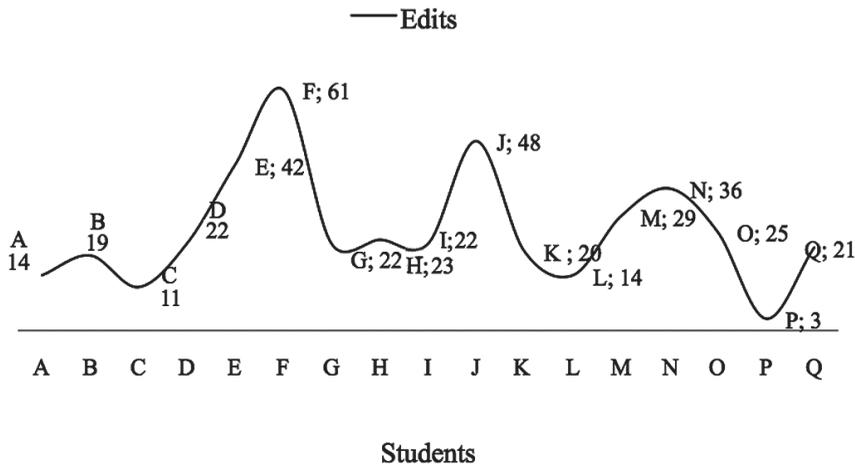
The frequency of visits is analyzed as a preliminary measure of the students' interests in the course content (Augar, Raitman, & Zhou, 2004). This wiki course visit history showed that students frequently visited the wiki course. There were 17 students in this wiki-based course in fall semester 2010. As seen in Figure 3, each module of the course received more than 350 visits from the 17 students, except for the policy informatics module. On average, each of the five modules that do not have face-to-face components receives 463 visits from the 17 students. Hence, each student visited the module 27 times on average over the 2-week active period of the module. The policy informatics module received fewer visits because a face-to-face meeting was arranged in the same module, and the meeting provided much information. In general, students regularly checked the wiki course for information seeking, knowledge sharing, and course content development.

Figure 3.
Students' Visits to Individual Modules



The second indicator we looked at was the frequency of wiki edits. This cowriting and coediting process matters because it transformed students' individual, solitary work into "a collective process" and encouraged "knowledge sharing and critical thinking" (Trentin, 2009, p. 44). In total, these 17 students edited the wiki spaces 432 times for various purposes, including co-creating course content in the book chapter review section, developing their personal wiki page, working together on the class project, and providing feedback on improving the students' work. Figure 4 shows how frequently each student edited the wiki pages. Letters represent students, and the numbers are the total edits students made throughout the course. On average, each student edited the wiki pages about 25 times. Three students edited the wiki pages over 40 times. Except for one student who edited the wiki page only three times, most of the students actively edited wiki pages to co-create course content.

Figure 4.
Students' Edits on Wiki



Collaborative Learning Outcomes

By the end of the class, students had developed an understanding of how information technology can be used to advance public services and transform the interactions between citizens and government. The class taught students about the rapidly advancing information technology available for public administration, and it also provoked students' deep thinking about the potential and caveats of applying information technology to government management practices. Following are some anonymous comments made by students in the formal class evaluations. One student noted:

I learned how technology can be used to change the relationship citizens have with government in a meaningful way. This was an incredibly dynamic class that pushed me to a new level of study and understanding.

Another student wrote:

This class takes time to show the benefits of innovation that electronic tools provide to public institutions. ... I had no feelings of frustration of the “swamp” of public administration, as discussed in the core courses. Instead, I felt that I can do something to make things better in a tangible way. It was incredible to learn about the current tools available to government, see ideas for what can be developed, and predict how the relationship of government with citizens will change if the ePA tools are developed.

On a scale of 1 to 5 (1 = very satisfied; 5 = very unsatisfied), students gave a 1.13 for the overall effectiveness of the course in a formal class evaluation conducted by the school. Students enjoyed the course content on the wiki co-created by the instructor and themselves. One student commented:

I have taken several online classes in the MPA program and have found them all to be severely lacking in many aspects until I took this course. This is the first ever online course I have taken that [I] actually benefited from being online rather than having the online aspect an obstacle to overcome.

Another student commented:

This was the best online course I have ever taken and one of the best courses in either the MPA or MPP Program. The course material was perfectly related to an online medium. The readings and online lectures were really engaging and thought provoking.

As explained at the beginning of the course, students were expected to learn by doing. Hence, to learn ways of using information technology for public administration, students were asked to explore various social media tools. An important learning outcome was students' capability of using the various information technologies. It turned out that all students successfully created their own wiki pages and completed tasks that required Twitter, Facebook, Google+, Yahoo, and Second Life experiences. After experiencing diverse tools, some students expressed their satisfaction and enthusiasm about familiarizing themselves with new IT tools for learning and collaboration as follows:

I thought that the use of different communication platforms were helpful. Learning how to blog, how to look at the ePA wiki space, and other sources used during the semester made me familiar with new technology tool... I feel that this class has two levels of instruction; the content discussed in class and the actual practice of using new areas. This was one of the best online classes I have ever taken, and surely one that relayed a great deal of new information and skills.

Students indicated that class activities enhanced their knowledge about the IT tools. They also expressed their confidence in using emerging interactive technologies tools for their future work. By experiencing different types of interactive technologies, students can actually develop a direct understanding of the potential benefits and challenges in applying these emerging information technology tools. In other words, asking students to apply IT tools in class can be an early step to address the challenge of improving information technology literacy in the public administration field, which has been a big concern for more than a decade (Dawes, 2004).

Building a Collaborative Learning Community: Responsibility and Collaboration

This wiki course found that an open process of participation in co-creating wiki pages and the integration of multiple social media communication tools can strengthen students' feeling of responsibility, foster students' sense of community, and develop students' collaborative orientation toward group work. Having students post their assignments on the blogs and share their work with others in an open space can increase students' level of accountability of individual participation and higher-quality products because students realized that the instructor as well as their fellow classmates will read their assignments carefully (Wheeler et al., 2008). This effect is reflected by the following student's comment:

I really enjoy having us put all of our assignments on the blog. It makes us more accountable in my opinion.

By working collaboratively on the class wiki paper, students realized the importance of teamwork for the class project. One student commented:

It showed us that we couldn't just depend on others to start the process. We all should have taken the time to collaborate together to get the paper started.

Another student expressed appreciation of the class project:

I have learned a great deal in the class and been forced to explore beyond my comfort zone some new technologies. I found the class paper assignment to be one of the best assignments of this class (or any other for that matter). I felt it pushed us all to truly experience what we are attempting to learn about: online collaboration.

There were other activities designed to encourage students to get to know each other and to create a sense of a learning community. Students were asked to create personal wiki pages to introduce themselves to others, to use instant messenger (Yahoo), Twitter, Facebook, and Google+ for information exchange, and to use blogs to share their assignments. By reading each other's wiki pages, all students successfully found commonality with more than one student in class. Students were asked not only to create the Facebook account but also to become friends with others on Facebook and start to follow people and their fellow classmates. After students started Twitter, they were asked to pick the most interesting tweets and add them to "our interesting things to follow" on their Twitter page. As part of each assignment, reminders were sent to participate in these alternative communication channels as part of the community-building activity.

In addition, the instructor tried to engage the students by sharing the previous class feedback, showing the evolution of the courses based on students' comments, and asking for feedback throughout the course. In traditional online courses, instructors often seek feedback at the end of each online module, or at the middle or end of the course. By contrast, students in this wiki-based course were asked to voluntarily create a wiki page to provide continuous feedback on improving the course. Students could also witness how the feedback was incorporated into restructuring the course, revising the existing modules, and developing the new modules. At the end of the course, students provided 2,299 words of comments and feedback. There were 183 views on this feedback wiki page. Ten students contributed their thoughts and provided detailed suggestions for helping the instructor to improve the course. In short, students collaboratively reflected on ways to improve the course. Overall, these findings speak to the previous study that highlighted the importance of using wiki to build a sense of collaborative learning community (Coutinho & Bottentuit Jr., 2007; Schroeder et al., 2010; Wheeler et al., 2008). As Coutinho and Bottentuit Jr. (2007) suggested in their study, the wiki activity can help students learn strategies of online communication, demand a higher level of student engagement, and develop the collaborative spirit (pp. 1789–1790).

Further Questions to Be Explored

This wiki course also posed challenges and questions to be further explored, including encouraging and assessing individual contribution to the group project and overcoming the frustration with technology at the beginning of the class. Even with emphasis on group work and a transparent mode of collaboration, some students still expressed their frustration with group work. After 4 years of continued efforts to design and revise this assignment, the instructor found

that the emergent process of collaborating and the quality of outcomes varied significantly: 3 years produced a high-quality result, and 1 year produced a very weak paper. Although students were told that this is group work and every student should contribute to the collaborative project, some students did not contribute, even though there was a transparent participation process with wiki history tracking of contributions from each student. This demonstrated the challenges of group work and tracking students' progress in the wiki-based learning environment. Although grading can be structured to motivate students to contribute to group work, to post comments and ideas, and to provide course feedback throughout the course, a more detailed instruction and structured grading rubric are necessary to better facilitate students' participation in the course projects. Hence, well-designed evaluation tools need to be in place to encourage quality participation from students and promote collaborative learning (Trintin, 2009). For collaborative projects, instructors need to specify the goals of the wiki project and how evaluation is linked with their contribution (Ben-Zvi, 2004). Students need to develop the general structure first and understand the links between each section to the main theme (Trintin, 2009). In other words, the wiki course needs to be designed to make it feasible to evaluate both individual and collaborative efforts.

Instructors should be prepared for critiques and answer questions about using the wiki as the class platform (Wheeler et al., 2008). Not all students were happy upon realizing that a variety of interactive tools were built into this wiki-based class. Some students felt somewhat overwhelmed and confused by the multiple platforms for communication. In response to the initial frustration from students, the instructor needs to introduce the rationale of having students learn various social media tools. In addition to the getting oriented module at the beginning of the course (designed to better introduce the emerging interactive tools such as the wiki to traditional online classes or face-to-face classes), instructors need to develop tutorial modules and a frequently asked questions section that is improved and built upon across class cohorts.

CONCLUSIONS

The purpose of this study is to examine how the wiki, as one example of a new interactive tool, can be used in public affairs education to better empower students and actively engage them in learning. This paper reviews the design and educational outcomes of a wiki-based course. Compared with previous online teaching systems that do not support current interactive applications or course designs that choose not to incorporate inactive techniques, this wiki-based course makes use of the user-centered attributes of interactive technology and involves students in co-producing course contents, collaborating on class projects, and providing comments and feedback to other peers and the instructor. Over the past four years, through the wiki platform, students have taken part of the responsibility from the instructor and become the course designer and developer under many circumstances. Students frequently added new information, edited existing course wiki pages, and provided comments and suggestions regarding course content. This course has developed and evolved with students' contributions

and participation. The flexibility and simplicity of wikis as a learning platform contribute to enhancing student learning and increasing the diversity of perspectives while maintaining quality. At the end of the class, students grasped concepts and theories in using information technology for public services.

Furthermore, in working on the wiki class projects, students developed a sense of responsibility, participated in collaborative work, and recognized the unique value of collaborations. This wiki-based course used a wide range of IT tools to create ongoing interactions and communications among students and between students and the instructor. In addition, by allowing multiple pathways to interact, learn and participate, each student's experience was customized to the learning goals he or she articulated. The public and material nature of the participation, through posting blogs and other shared content in the wiki environment, led to a high general level of accountability of individual participation and higher-quality products.

The use of a wiki platform is not limited to classes that have a focus on informatics management; the wiki component can be used in any type of course. Collaboration through wikis may also be used in civic engagement, nonprofit management, and community development courses to encourage students to learn about the collaborative process and foster a sense of community. The wiki platform can be used in face-to-face classes to supplement in-class discussions and provide students an easy-to-use collaborative platform. In fact, the inclusion of a wiki has been so useful for engaging students in class participation that the instructor has started using a wiki as a key component in a face-to-face undergraduate course called Public Management and Administration.

Lessons were learned from designing and improving this wiki-based course. Despite the great flexibility it afforded students to create their own wiki pages and to collaborate with other students, not all of the students actively participated in content creation and knowledge sharing. In other words, including the interactive tool in the class design does not guarantee collaboration and empowerment. Some students even expressed resistance to exploring various social media tools. In the first version of the course, students did not see why they had to join Facebook. Resistance to joining Facebook diminished each year, but similar resistance reemerged when students focused on the most current technology. To avoid or minimize confusion and frustration, goals and rationale of having the wiki-based collaborative projects need to be communicated with students in depth so that students understand why the technologies are used from the beginning of the class. Furthermore, clear instruction on group projects is needed to ensure that students understand their role and responsibility in the collaborative efforts. A structured grading rubric may serve well as the monitoring mechanism to give students further incentive to participate and collaborate. More sophisticated evaluation tools and feedback mechanisms need to be built into the wiki system to help assess both the quantity and quality of students' individual contributions and collective efforts. To better address these issues, more research is needed to study the role and impact of emerging social media tools in the field of public administration.

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