Investment and Return: Wiki Engagement in a "Remedial" ESL Writing Course

Sarah Nakamaru
Borough of Manhattan Community College/City University of New York

Abstract

This study explores the extent to which students in a community college remedial English as a second language (ESL) course engaged with a class wiki and the relationship between their pattern of engagement over time and success in exiting remediation. Participants included 47 students in two sections of ESL writing during the spring 2009 semester. Results showed that repeated out-of-class engagement over the course of the semester was positively associated with successfully exiting remediation. However, average level of engagement was low, suggesting that, in this context, technology-mediated learning activities do not necessarily lead to increased engagement. (Keywords: engagement, English as a second language, ESL, remedial English, postsecondary education, wiki, L2 writing)

It is widely assumed these days that many college students are digital natives who are not only adept at navigating various technological landscapes, but who also find technology inherently engaging and motivating (Prensky, 2001). Indeed, a recent Pew Research Center report indicates that 93% of American teens and young adults (aged 18–29) use the Internet, 79% of teens and 67% of young adults own an iPod or mp3 player, 80% of teens own a game console, and 51% of teens own a portable gaming device (Lenhart et al., 2010).

This reality clearly has implications for higher education, and there is a growing body of literature on the application of mobile devices, popular Internet tools, and Web 2.0 technologies to education (e.g., Bloch, 2007; Corbett, 2010; Godwin-Jones, 2003; Patch, 2010; Smith, 2008).

However, most research on technology in language education has been conducted in 4-year colleges or universities. It is not clear whether assumptions underlying research in 4-year settings or the conclusions drawn from this research are valid or applicable in other contexts. For example, open-access community colleges typically serve a much broader and more diverse population of students, and a large percentage of these students nationwide are placed into mandatory or involuntary remedial courses (Hughes & Scott-Clayton, 2010). I work in such a mandatory remedial program at the City University of New York (CUNY), where I teach English as a second

language (ESL). As in other mandatory remedial programs, morale can be low, and many (though not all) students are disengaged and even resistant. Instructors are eager to implement innovative teaching techniques and create a motivating classroom environment, yet research specifically relating to classroom technology use in this context is still sparse.

Within this context, I conducted a study of student participation in a class wiki in two of my ESL sections. The motivation for using a wiki came from promising findings in the literature about wikis (e.g., their ability to foster deep learning of content, attention to meaning, and collaboration) as well as their potential to foster and document student engagement. Finally, in the world of the mandatory remedial ESL class, the high-stakes test that serves as the ticket out of remediation and into disciplinary coursework looms large (Klages & Clark, 2009). Many faculty are torn between the desire to promote critical literacy, empower students, and attend to new and multiple literacies on the one hand, and to help students pass the test on the other. Some faculty and students feel that time and attention dedicated to the "bells and whistles" of new technologies would be better spent on teaching more directly the skills that paper-and-pencil tests measure. The purpose of this study, therefore, is to explore the extent to which students in a remedial ESL course engaged with a class wiki and the relationship between their pattern of engagement over time and success in exiting remediation.

Wikis

Wikis, which are Web pages that multiple users create and edit, are becoming more common in classroom settings as a forum for online collaboration. Lundin (2008) argued for incorporating wikis into first-year composition courses on the basis of their potential to challenge traditional assumptions about the teaching of writing in four areas: new media composition (What is "writing"?), collaborative writing (What is authorship? Ownership?), critical interaction (multiple ways to read and respond to peers), and online authority (Who is in control? Who has the right to create or change texts, conditions of participation, etc.?). In addition, wikis provide an integrated space for reading and writing, challenging the "artificial compartmentalization of research and writing" in traditional composition classrooms (Purdy, 2010, p. 48).

The research base on wikis in language teaching and learning is limited, but it is growing rapidly, and findings thus far are promising. Kessler (2009) studied 40 preservice teachers in an online, content-based English as a foreign language (EFL) class in Mexico. This study asked preservice EFL teachers to collaboratively define the term culture in a wiki that would remain a completely "teacherless" forum. To investigate whether a "many-to-many collaborative online writing task" would foster greater attention to grammatical accuracy, Kessler examined students' language-related episodes of editing. He found that the student teachers were more likely to attend to meaning than form and seemed to orient to the wiki as a space with lesser

demands for formal accuracy than more traditional academic forums.

In a study investigating the learning of content, rather than formal accuracy, Matthew et al. (2009) also studied the use of a wiki in a teacher education program. Participants were 37 preservice teachers in a language arts methods course collaborating to add content to already established content and dictionary pages in the class wiki. The researchers used post-semester interviews with students to understand how contributing to the wiki enhanced the learning of course material. Participants reflected positively on their experiences with the wiki. Specifically, they reported that the intensive reading and rereading involved with contributing content helped them to learn course concepts more deeply, and that contributing to the wiki helped convert inert knowledge into productive knowledge. The participants reported that the wiki will be useful as a repository of professional resources when they begin teaching.

In addition to form and content, the collaborative affordances of wikis lead to questions about process. Bradley et al. (2010) examined the nature of student interaction and collaboration in an English for specific purposes (ESP) course for Swedish software engineering students in information technology. Students worked in small groups to create content and provide feedback on other groups' pages. The researchers observed a range of interaction up to and including intense collaboration, in which multiple students contributed to a single, co-constructed text. These highly collaborative groups produced more versions of revised text, with a higher number of edits than their less collaborative peers. The researchers conclude that the affordances of the wiki (i.e., Web-based collaboration on writing) offer particular benefits for language learning, facilitating a "process that allows more revisions to improve text production" (p. 263).

Engagement and Community College

Though engagement is a multifaceted construct, for the purposes of this study, I adopt the definition of engagement as "the effort, both in time and energy, students commit to educationally purposeful activities" (Greene et. al, 2008, p. 514). This is one part of the multidimensional framework used by researchers with the National Survey of Student Engagement (NSSE) and its community college counterpart, the Community College Survey of Student Engagement (CCSSE). Results from these surveys consistently show that the more actively engaged students are, the more likely they are to learn and to achieve their academic goals (CCSSE, 2010). For example, researchers have noted links between student engagement and positive educational outcomes, such as grade point average and persistence (Kuh, 2001).

In addition, there appears to be a differential return on engagement, in which students of color and students with the lowest SAT scores benefit more from engagement than their higher-achieving peers (Kuh et al., 2008). In other words, engagement is particularly important for the population

of students typically enrolled in open-admissions institutions or remedial programs. Noting this, Greene et al. (2008) lament the dearth of research on engagement in community colleges and suggest that the link between effort and outcome could be a crucial factor in reducing racial achievement gaps in higher education.

Technology may be a fruitful direction for future research on engagement in community colleges. Indeed, in addition to the small but growing research base on wikis and other Web 2.0 technologies in education, a sizeable pedagogically oriented literature base informs teachers of the potentials, benefits, and instructions for setting up wikis for learning purposes. This is evidence of the widespread interest in the use of Web 2.0 for educational purposes as well as a general faith in the power of such technology to captivate students. Educators are often exhorted to incorporate technology so that they can catch up with their students and make instruction more motivating and connected to the kinds of things students are doing outside of school already (Hayles, 2007; Prensky, 2001; Smith, 2008). One such source, a description of a faculty workshop, asks "Are you baffled by Web 2.0? Are your students more savvy than you? Are they not engaged with their work? This workshop will focus on the technological edge we can harness in the ESL classroom with our digitally inclined youth" (Perry, 2009, n.p.; emphasis added). Most of this literature, however, is targeted toward or is based on the experiences of teachers and learners in 4-year university settings.

From Motivation to Investment

Engagement seems closely related to the construct motivation; e.g., perhaps students who are highly motivated engage more. Indeed, motivation has long been considered an important factor in language learning success. One early and influential construct of motivation was Gardner and Lambert's (1972) integrative-instrumental dichotomy. Learners who possessed integrative motivation desired to interact with the culture and speakers of the target language for personal pleasure or satisfaction or to integrate into the target culture. Learners who were instrumentally motivated pursued a second or foreign language as a means to attain specific goals, such as career advancement.

This construct overlaps in many ways with the notion of intrinsic vs. extrinsic motivation. Just as intrinsic motivation is thought to be a better basis than extrinsic motivation for persistence and success in general, integrative motivation was considered superior to instrumental motivation for language learning. For example, an integrative motivation might lead learners to more actively seek out members of the target language community to practice speaking, and meaningful interaction with speakers is more likely to facilitate acquisition than solitary study of grammar and vocabulary. However, the integrative-instrumental construct fell under heavy criticism both on the theoretical and empirical levels (Au, 1988). In addition to the difficulty of

separating and measuring integrative vs. instrumental motivation within an individual across time and situations, the construct also suffered from a lack of consideration of the social contexts in which learners acquire (or fail to acquire) languages.

Norton Peirce (1995) introduced the notion of investment to better capture the complex and conflicting factors affecting the extent to which language learners create, respond to, and sometimes resist opportunities to practice English. Rather than labeling learners with static personality traits like motivated or unmotivated, Norton Peirce showed how learners' complex social identities resulted in multiple and sometimes conflicting investments that affected their desire to take up opportunities to practice in a particular situated case. Further, she showed how inequitable power relations often determined who had the right to speak, meaning that opportunities to practice using English were not always a straightforward function of the motivation or desire of the language learner. In other words, even "highly motivated" students may fail to engage for a number of reasons, including feelings of alienation, frustration, or powerlessness that arise in social relationships external to the learners themselves (Norton, 1997).

Theoretical Framework

This paper relies on a theoretical framework that takes from Norton Peirce's (1995) concept of investment the notion that any particular, situated context will present unique opportunities and/or obstacles to engagement for learners. Thus, rather than attempting to locate factors influencing motivation solely within individual learners or solely within teachers and classroom activities, this framework interrogates the larger institutional factors that may affect learners' desires to invest.

A critical perspective on motivation seeks to situate individual learners within complex social and historical systems of activity, asking not whether the learner is motivated, but under what conditions learners will be motivated to take up learning opportunities (Norton Pierce, 1995). It is from this perspective that I argue that the remedial ESL class as it is realized in many institutions presents multiple obstacles to engagement and few incentives. In this section, I outline four overlapping factors that work against student engagement in this setting: the nondisciplinary nature of the course, the grade structure of the course, the diversity of technology identities of community college students, and the status of the course as a mandatory remedial. Taken together, and considered from the perspective of how they relate to student investment, they provide the theoretical frame for the questions of this study.

Nondisciplinarity and Engagement

What wikis do in nonclassroom environments is connect members of a community of practice (Lave & Wenger, 1991) who share some particular

interest; i.e., the community already exists, and the wiki facilitates collaboration among the members (who may not know each other). For example, Griffin et al. (2010) describe a wiki used to enhance collaboration among college and high school writing teachers who sought increased communication regarding assessment. In the classroom studies cited earlier (Bradley et al., 2010; Kessler, 2009; Matthew et al., 2009), the students likely viewed themselves as novices in real or imagined future communities of teachers or software engineers. This no doubt contributed to their motivation to engage with the projects in their respective classes.

Students in remedial ESL, in contrast, do not share any specific academic or professional goals. There is no authentic common ground among them, beyond the need to pass the same test at the end of the semester. These students come together not because of shared disciplinary or professional goals, but because of the shared experience of failure. Thus, identification with this community may be problematic and conflict with other social identities and investments (Pierce, 1995). Finally, the connection between participation in the wiki and the intended goal may be less clear than in disciplinary courses where wikis directly facilitate engagement with relevant (disciplinary) content (e.g., software engineering or language arts teaching methods). This may be particularly true when the wiki bears little surface resemblance to the paper-and-pencil final exam.

Grade and Credit Structure

In previous wiki studies, participation was a required and assessed component of the courses (Bradley et al., 2010; Kessler, 2009; Matthew et al., 2009), providing extrinsic motivation to participate. Further, students received academic credit toward their degrees for their successful completion of the courses, lending the courses (and the projects therein) meaning within the students' academic and career trajectories. This undoubtedly has an effect on the extent to which students participate in class activities, and students in different contexts might not behave the same way.

The ESL course in the present study is a pass/fail, non-credit-bearing course. This reduces the value of the course in the eyes of the students and provides less extrinsic motivation to participate in the work of the class (Block, 1992; Klages & Clark, 2009; Peele, 2010). The course outcome is decided solely on the test score and not on classroom participation, which further reduces the value of individual assignments. Grades can act as a powerful extrinsic motivator for students to complete work that they otherwise wouldn't. The grade structure of this course places an immense burden on individual students to be highly intrinsically motivated to do something that they are not intrinsically interested in. Of course, students are very interested in passing the high-stakes test. In fact, some of them feel that anything that does not look exactly like the test is a waste of time.

"Remedial" Status and Engagement

A course's status within the institution likely affects students' level of motivation to participate as well. Although remediation as an educational initiative has increased access to college and is seen as an important component in reducing inequality (Parker & Richardson, 2005), the term "remedial" has been criticized as pathologizing difference and locating deficits within individuals rather than within inequitable social structures (Rose, 1985). Canagarajah (2002) noted that labeling ESL as remedial reflects an orientation to language difference as a problem or deficit, calling "the term 'remedial'… a misnomer, as ESOL students are not remedying a lack but adding new communicative skills to the rich linguistic repertoire they already have" (p. 24). Thus, critics of the difference-as-deficit paradigm advocate acknowledging the linguistic diversity that exists in higher education and finding ways to use it as a resource rather than attempting to erase linguistic difference by separating multilingual students into noncredit language or writing programs (Canagarajah, 2002; Matsuda, 2006). (Of course, such a stance is not incompatible with the existence of second- or foreign-language classes that offer academic credit, nor does it support current anti-remediation movements.)

When courses or students are labeled remedial, they are explicitly positioned outside of the official curriculum of the college, creating a subclass of teachers and students. In our college, the entire department is outside the curriculum, as nobody majors in "developmental skills." Sense of belonging and affiliation with a community is an important component of learning (Lave & Wenger, 1991), and students kept outside of regular curricular boundaries may not feel part of the academic community. Worse, many people within and outside the college make clear their opinion that "some students just don't belong in college." If students internalize this attitude, it will have a negative effect on their desire to engage with college (CCSSE, 2010).

Further, students may become despondent when they are forced to repeat (and pay for) remedial courses time and time again, using valuable time and money but not making any progress toward a degree or even, in some cases, being allowed to engage with the content or ideas of their chosen field. Their pessimism is apparently well founded, as research shows that the majority of students placed in remedial coursework are less likely to complete the course, persist in college, or complete a degree (Greene et al., 2008). In particular, mandatory placement (as opposed to voluntary or self-directed placement) has a negative effect on course completion, achievement, and persistence (Hughes & Scott-Clayton, 2010). Thus, there is evidence that placement in remedial coursework has a negative effect on engagement, and there is certainly ample anecdotal evidence among teachers of these classes that students' frustration and cynicism is a major obstacle to getting them to engage.

Technology Identities

Although it is a common assumption that today's students are tech-savvy digital natives, material and sociocultural conditions strongly affect the kinds of technology that students use and the purposes for which they use them. For example, Andrews (2008) found differences in gaming activity and identity along gender and socioeconomic lines, calling into question some of the typical recommendations for harnessing games for education. Goode (2010) found that undergraduates arrive at campus with very different orientations to and attitudes toward technology (technology identities), which affects their desire or ability to engage with many aspects of college. Specifically, she found that technology literacy was an invisible requirement on campus that privileged students from white, middle-class backgrounds. Although she conducted her study at the University of California—Los Angeles, a major research university, the core finding was that low-income and minority students did not have the assumed access and facility with technology needed to navigate even everyday aspects of college. This is the same population of students that is likely to be overrepresented in community college remedial programs (Greene et al., 2008).

Indeed, there are striking parallels between Goode's (2010) analysis of the role of technology and of a critical analysis of remediation. Both technology and remediation have the potential to act as equalizers, yet both often serve to separate students who have already been socialized to have particular identities and stances (toward technology or academics) from those who haven't, privileging the former and penalizing the latter. In both cases, enriching, meaningful, authentic interactions are directed toward those who are the most likely to have already had such experiences and denied from those least likely to have had them. These inequitable distributions of instruction and socialization opportunities serve to create different types of identities, which in turn influences the extent to which individuals interact with or take up opportunities to engage with literacy or technology.

Method

Context for the Present Study

Borough of Manhattan Community College (BMCC) is part of the larger CUNY system and has more than 20,000 students. At BMCC, as at most colleges, courses designated as remedial do not bear credit, and students are placed into them involuntarily based on standardized test scores. Students are both placed into and allowed to exit from remedial ESL based on their score on the CUNY standardized writing test. In other words, students retake the same test (as the final exam of the course) to exit remediation and enroll in first-year composition.

CUNY introduced a new writing test in fall 2010, but the present study was conducted when the previous test, the CUNY ACT Writing Test, was

still in place. That test consisted of a timed, in-class persuasive essay written by hand. Essays were scored holistically with a 6-point rubric by two readers unconnected to the class who had been trained and certified to use the rubric. Norming to the rubric occurred at each scoring session. The scores of the two readers were summed, and a combined score of 7 was designated as the cutoff score for exemption or exit from developmental writing coursework. A third reader was assigned to read any essay that received nonadjacent scores by the first two readers.

Many students in our program are "multiple repeaters": They are caught in a cycle of failing the test and (re)taking the class, trapped in an "academic ghetto" (Klages & Clark, 2009). Motivation and morale tend to be low particularly among multiple repeaters, who are often discouraged, disengaged, and resistant. Students pass or fail the course based solely on the final exam score, regardless of attendance or participation. In other words, there is no extrinsic motivation provided for participating in class activities or completing assignments. In a very real sense, all assignments are optional, and it is widely acknowledged that attendance and participation are uneven.

In this setting, which arguably presents serious obstacles to engagement, I incorporated the wiki project (described below) and conducted a quantitative study of student participation. The research questions guiding the study are:

1. To what extent did students in an involuntary "remedial" ESL course engage in a semester-long ungraded wiki project?
2. What pattern of engagement over time was related to success in exiting remediation at the end of the semester?

Participants and Procedures

Participants were 47 students in two sections of the highest level of ESL writing during the spring 2009 semester. The sections were heterogeneous in terms of student demographics and represented the diversity of local immigrant communities. There were slightly more women (n = 25) than men (n = 22). Ages ranged from 18 to 74 years old, and the mean age was 26 (SD = 9.57). The participants' mean length of time in the United States was 5.63 years (SD = 6.83). Roughly half of the participants (n = 24) had attended high school in their home country. Among the remaining students, 14 had attended U.S. high schools, six had attended high schools in both the United States and their home country, and three had earned a GED. Twenty reported home countries and 17 languages were represented: Spanish, Korean, Chinese, French, Wolof, Bangla, Polish, Albanian, Amharic, Arabic, Creole, Japanese, Russian, Tagalog, Tigrigna, Turkish, and Uzbek.

I designed the wiki project as an instructional activity to help students reach course objectives (improving English language and academic writing skills, as measured by performance on the final exam). In addition, I introduced a wiki to provide students with opportunities to practice multimodal

and hypertext authoring in a meaningful context; to give them practice searching, navigating, and evaluating online information sources; and to integrate reading and writing in one digital space. Collaborative writing, per se, was not a goal of the wiki; rather, collaborative resource sharing and facilitation of interaction and feedback were the goals.

Each class had its own wiki, housed within the course Blackboard site. The wikis consisted of linked Web pages of three varieties: reading, student writing, and vocabulary. The reading page functioned as a collective blog where users posted titles, links, and brief summaries of interesting and relevant articles. Writing pages were a place for students to post their assigned essays. Each student had a page, and each student page was linked to the home page. I encouraged students to read and comment on each other's writing. Finally, vocabulary pages were collaboratively created corpora of thematically relevant vocabulary. Each main vocabulary page contained a list of words related to the topic, with each word hyperlinked to a page containing collocations for the word. For example, the Economy vocabulary page listed the following collocations (among others): *local economy, stimulate the economy, rural economy, it's an economic reality that….*

I first introduced the project in the computer lab by projecting the wiki onto a screen, clicking through the few pages that initially existed, and demonstrating how to create, edit, and link pages. I posted written instructions within Blackboard as well and gave students time in the computer lab to practice manipulating the technology by creating their own pages and linking these pages to the home page. Students could work together at the lab and get support from me and the lab staff. After that first introduction, I gave students regular assignments to contribute to the class wiki, including posting essays, reading and commenting on classmates' essays, researching and contributing collocations for key vocabulary words, and contributing to the class reading log.

I held class in the computer lab every other week, for a total of five sessions, to provide students time and support to contribute to the wiki, and I encouraged students to visit and contribute to the wiki on their own time as well. I envisioned and promoted the wiki as a collaboratively built resource for improving English language and academic writing skills. I contributed to the wiki as well, posting reading-log entries, collocations, and comments on student writing. However, I did not correct or change students' contributions. The majority of my edits involved infrastructure or administrative tasks to keep the wiki organized.

Data Sources

The data for this study consist of the archived activity recorded within each wiki. A feature of wikis is that they record every change to the wiki, so that previous iterations of any page can be viewed or restored and authorship can be determined. The wiki records three basic types of activity: page edits, page views, and page comments. Each page edit is recorded in the history of

the page, with the user's name and the date and time of the edit. Page views are not identified by user, but only counted; each time a user visits a page, it is counted as one view. Comments, like page edits, are identified by name, date, and time1. In addition to the wiki data, I also used demographic information and final course outcome (pass or fail, based on exam score) for each student in the analysis.

I recorded page views first by visiting each separate page of both wikis (n = 205) and subtracting one view to compensate for the research-related view. I recorded edits next. I examined and coded each student edit (n = 883) individually for date, time, and kind of activity (i.e., the substantive nature of the contribution). Among the kinds of edits students made were adding content/text, deleting content/text, adding images or emoticons, creating links to other pages within or outside of the wiki, making formatting changes, revising existing text, and correcting language or technical errors. Finally, I sorted edits by user to arrive at each student's profile of total editing activity.

Data Analysis

Research question 1. Research question 1 addresses the extent of participation in the project. To answer this question, I generated descriptive statistics for three levels of analysis: by each wiki as a whole, by page type within the wikis, and by individual students. At the level of individual students, I analyzed four variables of interest: total number of edits, in-class edits, out-of-class edits, and number of occasions of editing activity.

I calculated the total number of edits for each student by sorting the edit data according to user. However, because I was interested in looking at patterns of wiki activity over time, when the edits were made was as important as the total number of edits. For example, as I provided time in class for students to edit the wiki, the distribution of in-class and out-of-class activity was a variable of interest. Similarly, whereas some students showed a flurry of activity on one occasion, never to return, others made a small number of edits on each of several occasions over the course of the semester. Thus, number of occasions of editing activity was also a variable of interest.

To get a picture of the average extent of participation, I generated frequency data on these variables for individual students. In other words, I counted the number of total edits, the number of in-class and out-of-class edits, and the number of occasions of editing activity to arrive at a particular value for each variable for each student. I then calculated how many times each value appeared in the data. Finally, I plotted these data visually on separate histograms to compare them to a normal curve.

Research question 2. Research question 2 addresses the relationship between pattern of participation and success in exiting remediation at the end of the semester (i.e., final course outcome). To shed light on this question, I

1 Due to the small number of comments on the wikis (n = 33), I did not analyze comments in this study.

Table 1. Variables

Variables	Description
Age (in spring 2009 semester)	
Sex (Male = 0, Female = 1)	
Length of residence in U.S. (years)	
Years speaking English	
Final exam outcome (Not pass* = 0, Pass = 1)	
Total edits	Total number of edits made by student
In-class edits	Number of edits made by student in class (at the computer lab)
Out-of-class edits	Number of edits made by student outside of class
Editing occasions	Number of occasions the student engaged in editing activity

*Includes four students who did not show up to take the final exam

Table 2. Overview of Wiki Activity

	Student Users	Pages	Total Student Edits	Views*	Student Comments
Wiki 1	24	108	466	4,417	13
Wiki 2	23	97	417	4,365	20
Total	47	205	883	8,782	33

*Includes both student and instructor views, as the viewer cannot be determined.

Table 3. Activity by Page Type: Wiki 1* (Student Users n = 24)

Page Type	*N*	Views	Student Edits	Student Comments
Reading	6	183	56	1
Writing	51	2,057	284	10
Vocabulary	49	718	75	2
Home	2	1,459	51	0

Table 4. Activity by Page Type: Wiki 2* (Student Users n = 23)

Page Type	N	Views	Student Edits	Student Comments
Reading	3	193	39	0
Writing	45	1,954	234	15
Vocabulary	48	741	96	2
Home	1	1,477	48	3

*Includes duplicates and misplaced or deleted pages

calculated Pearson's product moment correlation coefficients between each of the four editing variables (total edits, in-class edits, out-of-class edits, number of editing occasions) and final course outcome (see Table 1). I included demographic variables such as age and number of years living in the United States to discover any potentially confounding factors.

Results

This section first presents the findings related to research question 1, on the extent of participation. Findings are presented for different levels of detail: overall total participation, participation by page type, and participation by individual students. At the level of individual student participation, this

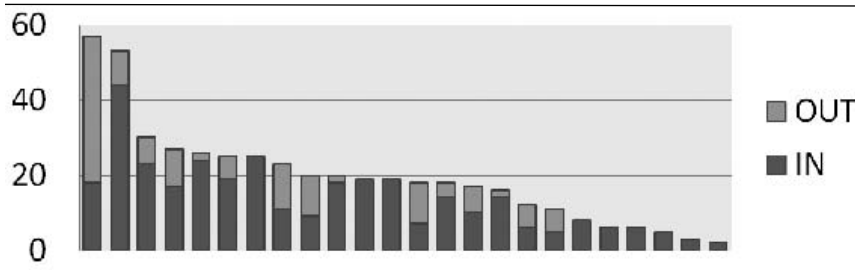

Figure 1. In- and Out-of-Class Edits on Wiki 1.

section presents findings for each of the variables of interest: total number of edits, in-class edits, out-of-class edits, and number of separate occasions of editing activity. Finally, it presents findings related to research question 2, on the relationship between pattern of editing activity and final outcome.

Investment: Student Participation Results (Findings for Research Question 1)

Overall total student participation. I found that both wikis contained a good deal of total documented activity, and they were roughly similar in the number of pages, edits, views, and comments made. Table 2 presents an overview of the observable activity on each wiki.

Student participation by page type. In both wikis, writing pages were by far the most frequently viewed, edited, and commented on (see Tables 3 and 4). The home pages of each wiki were the second most viewed because they served as the landing sites within each Blackboard site.

Participation by Individual Students: Total Edits and In- and Out-of-Class Edits

Though the overall level of participation initially seemed encouraging, the picture changed upon examining the distribution of participation across individual students. When looked at from this more detailed perspective, typical participation was quite low. In Wiki 1, for example, two students each made approximately twice as many edits as the next most frequent editor. In addition, several never contributed outside of class time (see Figure 1). Results were largely similar for Wiki 2.

Tables 5–7 (p. 286) show frequency data on the number of total edits, in-class edits, and out-of-class edits for all students in the study. For all variables, the frequencies peak in the lower intervals and fall off dramatically. Although all students made at least one edit during the in-class time provided in the computer lab, 32% (n = 15) of students did not make a single edit outside of class time (see Table 7).

Participation by Individual Students: Separate Editing Occasions

Table 8 (p. 287) shows frequency data on the number of separate occasions of editing for all students in the study. Forty-seven percent of students made contributions on four or fewer occasions over the course of the semester,

Table 5. Total Edits

Total Edits (*n*)	Students (*n*)	Cumulative Frequency	Percentage*	Cumulative Percentage**
0	0	0	0	0
1–10	10	10	21.28	21.28
11–20	22	32	46.81	68.09
21–30	9	41	19.15	87.23
31–40	3	44	6.38	93.62
41–50	0	44	0	93.62
51–60	3	47	6.38	100

Table 6. In-Class Edits

In-Class Edits (*n*)	Students (*n*)	Cumulative Frequency	Percentage*	Cumulative Percentage**
0	0	0	0	0
1–10	23	23	48.04	48.04
11–20	17	40	36.17	85.11
21–30	4	44	8.51	93.62
31–40	2	46	4.26	97.87
40–50	1	47	2.13	100

Table 7. Out-of-Class Edits

Out-of-Class Edits (*n*)	Students (*n*)	Cumulative Frequency	Percentage*	Cumulative Percentage**
0	15	15	31.91	31.91
1–5	12	27	25.53	57.45
6–10	11	38	23.40	80.85
11–15	5	43	10.64	91.49
16–20	2	45	4.26	95.74
21–25	0	45	0	95.74
26–30	1	46	2.13	97.87
31–35	0	46	0	97.87
35–40	1	47	2.13	100

*Percentage is calculated from frequency (n students). Due to rounding, the total may not equal exactly 100.

**Cumulative percentage is calculated from cumulative frequency.

despite the fact that class was held in the computer lab five times to provide time and support for making wiki contributions. This means that almost half of the students either missed class on one or more computer lab days or spent the lab time doing something besides the assigned wiki contributions.

Table 9 presents statistics describing the shape and spread of the frequency distributions. Examining the data visually using histograms overlaid with a normal curve indicated that participation was not normally distributed for any of the types of wiki activity. That is, distributions for total edits, in-class edits, out-of-class edits, separate editing occasions, and comments were all severely positively skewed. This indicates that the bulk of the data lie to the left of the median, with lower levels of participation (fewer edits and comments) represented more than higher levels. In other words, there were a

Table 8. Separate Editing Occasions

Editing Occasions (*n*)	Students (*n*)	Cumulative Frequency	Percentage*	Cumulative Percentage**
0	0	0	0	0
1–4	22	22	46.81	46.81
5–8	21	43	44.68	91.49
9–12	3	46	6.38	97.87
13–16	0	46	0	97.87
17–20	1	47	2.13	100

*Percentage is calculated from frequency (n students). Due to rounding, the total may not equal exactly 100.

**Cumulative percentage is calculated from cumulative frequency.

Table 9. Distributions of Editing Activity for Both Wikis

	Total Edits	In-Class Edits	Out-of-Class Edits	Separate Editing Occasions
N	47	47	47	47
Mean	18.79	12.89	5.89	5.09
Median	17.00	11.00	2.00	5.00
Mode	19	19	0	7
SD	13.171	8.972	7.875	3.263
Skewness	1.406	1.233	2.259	1.462
Std. Error of Skewness	.347	.347	.347	.347
Minimum	2	2	0	1
Maximum	59	44	39	18

small number of high-intensity editors, but the majority of students participated much less; some, in fact, participated minimally.

Return: Correlates with Final Course Outcome (Findings for Research Question 2)

Total number of edits correlated moderately with passing the writing test at the end of the semester. Number of in-class edits, however, did not significantly correlate with final outcome. Instead, successfully exiting remediation was much more strongly associated with out-of-class edits and number of editing occasions. In other words, repeated out-of-class activity over the course of the semester was more closely related to positive final course outcomes than mere quantity of activity, meaning that when and how often were more important than simply how much. This was true despite wide variation in the substantive kind of editing activity students engaged in (e.g., formatting changes, adding text, revising text, inserting emoticons, inserting greetings to other students, etc., as determined by the initial coding of each edit). Table 10 (p. 288) presents Pearson Product-Moment Correlations.

Overall, the findings indicate that average levels of engagement with the project were quite low, and that, whereas a few students participated actively and frequently, the majority of students participated to a much lesser extent. In addition, there was a strong, positive relationship between wiki engagement and passing the final exam for students in this study. Further, the

Table 10. Correlations

	Final Exam Outcome	Age	Sex	Years in U.S.	Years Speaking English	Total Edits	In-Class Edits	Out-of-Class Edits	Separate Editing Occasions
Final Exam Outcome	1	-.006	.078	-.114	.061	.373**	.112	.495**	.502**
Age		1	.089	.696**	.592**	-.254	-.291*	-.094	-.214
Sex			1	.236	.196	.093	-.054	.217	.196
Years in U.S.				1	.865**	-.250	-.191	-.201	-.232
Years Speaking English					1	-.120	-.169	-.009	-.149
Total Edits						1	.812**	.747**	.727**
In-Class Edits							1	.219	.438**
Out-of-Class Edits								1	.717**
Separate Editing Occasions									1

*$p < .05$, two-tailed. **$p < .01$, two-tailed.

pattern of wiki participation across time—frequent, sustained engagement over the course of the semester—was more strongly correlated with ultimate success than mere quantity of activity.

Discussion

There was a strong, positive relationship between wiki engagement and passing the final exam for students in this study. Further, the pattern of wiki participation across time—frequent, sustained engagement over the course of the semester—is as important a factor as the total amount of activity. Of course, correlation does not mean causation, so directionality of the relationship cannot be claimed. Nevertheless, it is possible that engaging in the activity in and out of class offered a way for some students to engage more deeply with the class or with language and literacy and to expand their academic English proficiency.

The positive findings from this study offer a number of (cautious) implications for implementing wikis in writing classrooms. First of all, the fact that student-created content (the student writing pages) generated the most wiki activity is encouraging and suggests that projects like this should be largely structured around students' own content. This fits in well with constructivist and student-centered approaches to instruction and makes a strong case for the use of Web 2.0 technologies, as they specifically facilitate creation and production of online content. Second, findings indicated that repeated activity over time is positively associated with academic success. This suggests structuring long-term projects that provide opportunities for students to go back again and again. A wiki is ideal for this, as it creates an online environment that endures and evolves over time.

Crucially, the findings show that there was no detrimental effect (in terms of performance on the final exam) to participating in the wiki project, even though the activity bears little similarity to the paper-and-pencil test. This is

important given some students' fear that technology-mediated activities are a frivolous waste of time, or the fear among some faculty that students will be distracted by technological bells and whistles. In this study, even when students attended to seemingly insignificant editing (e.g., inserting emoticons into their texts), there was still a positive correlation with success at the end of the course when that attention was sustained during frequent out-of-class visits to the wiki. Thus, there is likely an effect of the engagement itself beyond the particular skill practiced or content learned. A crucial question for teachers in community colleges is the extent to which technology-mediated activities can actually stimulate or enhance engagement.

Indeed, despite these positive findings, this study also documented a depressingly low level of engagement with a Web 2.0–mediated learning activity that was extensively scaffolded and promoted. Existing research on wikis in language classrooms does not directly address the question of participation, so it is impossible to compare other studies to this one. Nevertheless, previous studies describe in detail the ways students actively used the wikis, suggesting that in those contexts, lack of engagement was not a salient issue. Students cannot reap the potential benefits of wikis if they don't engage, and students in the present study largely failed to engage.

Research from the perspective of individual differences might seek to show that some students are simply "highly motivated" or "autonomous learners." Of course, individual differences do exist among students, and it is entirely possible that the highly engaged students in this study possessed superior motivation, leading to higher levels of participation and greater ultimate success. However, this in and of itself is not particularly interesting from the theoretical perspective of this paper, which asks not whether a student is motivated, but under what conditions students will be optimally motivated or engaged. It is not satisfactory to write off the majority of the class as "unmotivated" without a careful consideration of the larger institutional conditions that might be affecting motivation. Although data from this study do not directly provide evidence for why students were or were not motivated, they do indicate that within this institutional context, motivation for this project was low. Given the (implied) contrast to findings from previous research on classroom wikis, this highlights the importance of contextual differences in research on classroom technology.

Conclusions

Though this quantitative study of engagement with technology in a particular context has limitations, including the lack of student perspectives, it offers some important overall implications and directions for future research. First, for teachers and administrators, findings from this study suggest that wikis, as an exemplar of Web 2.0 technology, are not a magic bullet for increasing motivation in this context. Indeed, it is likely that no classroom-level innovation can truly overcome deeply entrenched institu-

tional (and social) obstacles to engagement in programs structured around deficits and failure and occupying a marginalized position within the university.

Second, in the area of educational technology research in general, findings from this study highlight the importance of context in evaluating the outcomes of technology use in education. Extra-wiki conditions will certainly influence students' ability, willingness, and desire to take up opportunities to interact with technology, not to mention the ways that they do so. All this in turn affects the benefits to be reaped. This suggests caution in claiming that certain forms of educational technology are in and of themselves beneficial or effective. Given the potential for technology to enhance engagement in general, and the importance of engagement in community college settings in particular, more qualitative research on the nexus of learner, tool, and context is necessary.

Author Notes

Sarah Nakamaru is an assistant professor of English as a second language at the Borough of Manhattan Community College (City University of New York) and associated faculty in the Department of Linguistics at the University of Quebec at Montreal. Please address correspondence regarding this article to Sarah Nakamaru, PhD, Borough of Manhattan Community College/ CUNY, 199 Chambers St., N420, New York, NY 10007. Email: smn239@nyu.edu

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