

Does It Really Matter? Using Virtual Office Hours to Enhance Student-Faculty Interaction

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ABSTRACT

The use of Web-based learning technologies has increased dramatically over the past decade providing new opportunities and avenues for students to interact with their professors virtually using computer-mediated communication (CMC) technologies. In this article, the authors share their experiences and findings with the use of virtual office hours as a medium for students to communicate with their professors using a Web 2.0 technology, namely Facebook's instant messaging (IM) client. Participants in the study included both traditional and nontraditional undergraduate students enrolled in on-campus MIS courses at a public U.S. university in the southeast. The findings suggest that students' use of virtual office hours is not significantly different from their use of traditional office hours; however, participants in classes that offered virtual office hours reported higher levels of satisfaction with office hours than students in classes that offered only traditional face-to-face office hours. Implications for faculty designing courses using virtual office hours as a teaching and learning tool are discussed.

Keywords: Virtual Office Hours, Computer-Mediated Communication, Web 2.0, Facebook Instant Messaging Client, Student-Faculty Interaction.

1. INTRODUCTION

The use of Web 2.0 technologies in higher education is transforming learning and teaching in significant ways. Recent studies, for example, have examined the use of Web logs (Williams and Jacobs, 2004), wikis (Boulos, Maramba, and Wheeler, 2006), and instant messaging (Jeong, 2007; Contreras-Castillo, Pérez-Fragoso, and Favela, 2006) in the classroom environment. Universities and colleges are rapidly embracing these new technologies and leveraging them to not only enhance their traditional curriculum but also to extend course offerings beyond the college campus. One key area where Web-based technologies are predicted to have a significant impact is in their ability to transform the way in which professors and students are able to communicate and interact with one another.

The importance of informal interaction between faculty and students has been studied extensively in the literature (e.g., Iverson, Pascarella, and Terenzini, 1984; Kuh and Hu, 2001; Pascarella and Terenzini, 2005; Halawah, 2006). Nadler and Nadler (2000) found that higher levels of informal contact with faculty correlated positively with students' academic performance, satisfaction with their college experience, and retention. Cox and Orehovec (2007)

argued that even non-academic interactions between students and faculty have a positive impact by making students feel more valued and important, which, in turn, may contribute to higher levels of student persistence.

Several researchers have noted the potential for computer-mediated communication (CMC) to increase the amount and frequency of interaction between students and their instructors (Chou, 2001; Klassen and Vogel, 2003; Cox and Orehovec, 2007). The literature on the use of Web-based communication tools, however, suggests there is still much to learn about its impact on traditional measures of student success in higher education. Most studies related to the utilization of Web-based technologies in general focus on the comparison of traditional versus online courses along a range of measures including student satisfaction, retention, and performance (Hannay and Newvine, 2006; Smart and Cappel, 2006; Oomen-Early et al., 2008). According to Wingard (2004), the use of Web-based technologies is actually more prevalent in the traditional classrooms as faculty increasingly utilize these technologies to enhance learning activities within the classroom and support communications outside the classroom.

Web 2.0 technologies and their increasing use in higher education have presented educators with unique

opportunities to further engage students in the learning environment using these new technologies. In this study, Web 2.0 technologies and applications are defined following the conceptualization by Tim O'Reilly who first articulated the term in 2005, and later defined Web 2.0 by characterizing the "Web as platform," and Web 2.0 applications that run on the platform as services that provide users control over their own content and facilitate collaboration between individuals and groups (O'Reilly, 2007, p. 19). Web 2.0 technologies are most often associated with social networking Websites such as MySpace (2009), Facebook (2009), and YouTube (2009), as well as applications such as blogs, wikis, and podcasts that are used to create and share information.

A relatively new trend in higher education is use of Web 2.0 technologies to facilitate virtual office hours using "chat" or IM tools for both distance learning environments, and as a supplement to traditional pedagogical practices of face-to-face office hours (Myers, Bishop, Sayee, and Kelly, 2004; Hooper, Pollanen, and Teismann, 2006; Riley, 2007). Past studies have explored the use of IM or "chat" functions in general (Hu, Wood, Smith, and Westbrook, 2004), and in organizational settings (Cameron and Webster, 2005; Quan-Haase, Cothrel, and Wellman, 2005), and found support for its role in facilitating social connectedness, and as an emerging collaborative communications tool, respectively. In this study, we focus on the utility of IM in the academic environment. Specifically, we present empirical findings measuring traditional and nontraditional students' utilization of virtual office hours facilitated by an IM client, and students' overall satisfaction with office hours in traditional on-campus MIS courses. Participants included students enrolled in courses that offered virtual office hours using the IM function of the popular social networking site, Facebook, in addition to traditional office hours, and students enrolled in courses that offered only traditional office hours. The related literature on student-faculty interaction and synchronous learning environments is discussed, as well as the methodology used in the study. The paper concludes with the findings of the study and implications for faculty in designing courses that offer virtual office hours.

2. LITERATURE REVIEW

2.1 Student-Instructor Interaction Outside the Classroom

Researchers have long sought to understand the factors that influence student satisfaction and retention in the academic environment. Most studies have shown that involvement in college activities outside the classroom and interactions with other students and faculty can have a profound impact on students in terms of retention, academic performance, and overall satisfaction (Astin, 1999). In his study of the effects of out of classroom experiences, Kuh (1995) found that participation in college activities, living on campus, and conversing frequently with other students and faculty positively influenced students' learning and personal development.

Studies focused primarily on the effects of student-faculty interaction outside the classroom have consistently found that informal contact between professors and their students was positively associated with personal, social, and intellectual outcomes as well as students' overall satisfaction

with their college experience (Pascarella, 1980; Endo and Harpel, 1982; Fusani, 1994; Myers, Martin, and Knapp, 2005; Halawah, 2006). In their meta-analysis of student-faculty interaction, Kuh and Hu (2001) explored both the frequency and nature of out-of-class interactions between students and faculty over a period of time and found a positive correlation between the interactions and positive student outcomes despite the myriad of changes that have taken place in higher education over time.

2.2 Student-Faculty Interaction and Office Hours

Despite the positive benefits of student-faculty contact outside of the classroom, most studies have found that actual communication between faculty and their students is infrequent, and largely limited to formal and structured situations such as classroom lectures (Pascarella 1980; Jasma and Kopper, 1999; Nadler and Nadler 2000). The traditional practice of holding office hours has long been a required part of a professor's teaching responsibilities, and is designed to provide students the opportunity for informal communication beyond the classroom to seek additional help and ask questions (Acitelli, Black, and Axelson, 2003). The value of office hours is widely thought of as a key aspect in facilitating the relationship between students and their instructors; however, studies have shown that, in practice, students rarely take advantage of the opportunity and, when they do, the duration of the visits tend to be brief and concise in nature (Nadler and Nadler, 2000; Ku and Huh, 2001; Bippus, Kearney, Plax, and Brooks, 2003). Studies by Jasma and Kopper (1999) and Fusani (1994) found that fewer than half of the students in the study reported visiting their professor outside the classroom.

Recently, the Internet and Web-based course management systems have created a convenient alternative to traditional office hours for many students who have substituted email and discussion board postings for face-to-face meetings as a means to ask questions or obtain course-related information or additional help. These new, and often preferable, means of interacting with professors through Web-based technologies have some researchers predicting the demise of traditional face-to-face office hours (Myers et al. 2004).

Most research in this area has concluded that, while the benefits of student-faculty interaction outside the classroom are significant and related to positive student outcomes, there is little known about the processes that facilitate and influence the occurrence of out-of-class interactions (Bippas et al., 2003; Cotten and Wilson, 2006). A key challenge for colleges and universities is to understand how to better engage students in the communication processes that stimulate more substantial and frequent interaction with faculty. One such avenue for facilitating more frequent interaction is to leverage computer-mediated communications to enhance traditional office hours. In a recent study by CDW assessing the current state of technology in higher education, students indicated they wanted more regular and immediate communication with faculty, and rated online chat with professors as the capability they desired the most (CDW Government, 2008). In their study of e-learning environments, Jafari, McGee and Carmean (2006) also found that students preferred free and popular communication technologies such as IM and podcasts, and wanted these

tools integrated into the course environment for both communication and collaboration.

2.3 Synchronous Communication to Facilitate Student-Faculty Interaction

The use of the Internet in higher education is generally seen as a delivery vehicle for information and communication with tremendous potential for extending the communication channels most commonly found in traditional learning environments. The most common forms of communication used by faculty to facilitate interaction with students include the use of asynchronous (e.g., email and online discussion boards) and synchronous communication (e.g., chat or instant messaging). The majority of research related to the use of asynchronous communication in higher education has focused on distance learning courses that utilize Web-based communication technologies to deliver course content virtually, and thus, involves extensive student-instructor communications (Dezhi, Bieber, and Hilz, 2008; Oomen-Early et al., 2008). These types of courses are commonly defined as asynchronous learning networks (ALN) and often include the use of technologies for synchronous chat and other electronic media for course communications.

Synchronous online communications, most commonly in the form of "chat" or instant messaging, have been used with success in several studies of distance learning environments (Cox, Carr and Hall, 2004; Myers et al., 2004). Spencer and Hiltz (2003) conducted a field study of synchronous chat in an online course and found student satisfaction highest in courses where synchronous chat sessions were offered in addition to face-to-face methods. In a comparative study of synchronous and asynchronous learning technologies, Schwier and Balbar (2002) found that synchronous chat helped build a sense of community and continuity among students enrolled in a graduate course; however, students found the synchronous chat function less effective than asynchronous discussion forums for reflective learning. This finding was consistent with Cox, Carr, and Hall's (2004) study which found the "chat" function of commercial course management systems less effective for more in-depth topics.

The use of chat or IM to facilitate student-interaction and virtual office hours in online courses and traditional courses has also been explored in recent studies (Myers, et al., 2004; Jeong, 2007). Hooper, Pollanen, and Teismann (2006) found positive benefits of utilizing virtual office hours in terms of effectiveness and participation of students enrolled in an online introductory mathematics course. In a study of the impact of offering virtual office hours within a traditional course, Meyers (2003) found that students who had participated in virtual class discussions had higher levels of comfort and confidence during traditional classroom discussions. In a recent experiment at Harvard Business School, virtual office hours were offered to students in an introductory computer science class with the intent of addressing the need for flexibility and convenience. Feedback from students was generally positive about the availability of help outside the classroom although professors indicated they did not foresee virtual office hours completely replacing traditional hours anytime soon (Riley, 2007).

Despite the successful integration of Web-based technologies in both online and traditional learning

environments, some researchers have also noted concerns related to their use. Farmer (2003) concluded from his study of IM usage in the classroom that, while IM offered benefits of increased communication between faculty and students, there are many potential drawbacks including increased workload and time commitment for faculty as a result of student expectations of "ubiquitous instructor access."

Jeong (2007) noted issues related to miscommunication due to the lack of verbal cues and drawbacks associated with the lack of interoperability between IM clients.

3. RESEARCH HYPOTHESES

In this study, we investigated students' utilization of office hours when virtual office hours were offered as an alternative means of communication for students in addition to traditional office hours. The intent of offering an additional communication medium was to provide students with increased opportunities for interaction with the professor at extended times that may be more convenient for nontraditional students, or traditional students who may have other obligations during the professor's posted office hours. We hypothesized that students in evening classes would be more likely to use office hours than the more traditional daytime students, and that students enrolled in classes that offered the additional office hours would have higher levels of satisfaction with office hours in general.

Most of the research on virtual office hours treats students as a single group. However, there are generally two distinctive types of students in universities: traditional full-time students who generally do not work or work part-time and nontraditional students who are employed full-time and attend classes either full-time or part-time. In the participating university, traditional students normally enrolled in daytime classes and nontraditional students normally enrolled in evening classes. We argued that evening students were more like to utilize virtual office hours than daytime students primarily due to work schedules and convenience factors. This leads to Hypothesis 1:

H1. Evening (nontraditional) students are more likely to use virtual office hours than daytime (traditional) students are.

The implementation of virtual office hours in addition to traditional office hours was intended to provide greater flexibility and access for students and promote increased levels of student-faculty interaction outside of the classroom. By recognizing the unique needs of nontraditional and evening students and providing additional communication opportunities, it was predicted that nontraditional and evening students would have levels of overall satisfaction with office hours. We surmised that students would see faculty as more accommodating and understanding of the inherent challenges students enrolled in evening classes often face.

Bippas, et al., (2003) found that instructor's perceived accessibility is positively associated with students' willingness to engage in extra-class communication, which in turn, is related to their overall course satisfaction. We propose that by supplementing traditional office hours with virtual office hours, faculty would be more accessible and available to help students quickly and more conveniently get answers to

questions or problems and thus, improve the students' overall satisfaction with office hours. This leads to the hypothesis 2 of the study:

H2. The overall satisfaction with office hours of students who enrolled in classes offering virtual office hours will be higher than the overall satisfaction with office hours of students who enrolled in classes that do not offer virtual office hours.

4. RESEARCH METHODOLOGY

To test the research hypotheses, we applied a survey-based methodology in this study. The study was conducted during a regular academic semester. A pre-study survey and a post-study survey were administered at the beginning and end of the semester, respectively. All surveys were anonymous to ensure that students could freely express their opinions. The utilization of virtual office hours was recorded during the academic semester.

As shown in Table 1, the research subjects were from five MIS classes in a public university in the southeastern United States. Among the five participating classes that were taught by two MIS faculty, three were daytime classes and two were evening classes. Three classes (two daytime classes and one evening class) were offered with virtual office hours and the remaining two classes (one daytime class and one evening class) were used as control group.

Research Subjects	Daytime classes	Nighttime classes
Classes with virtual office hours	Class 1, Class 2 (faculty 1)	Class 4 (faculty 2)
Classes without virtual office hours	Class 3 (faculty 2)	Class 5 (faculty 1)

Table 1. Research Subjects

The two instructors had similar teaching styles. They both used a popular Web-based course management tool extensively for each of their courses and published the majority of classroom material on the course Website. Each instructor had at least one evening and one daytime class participate in the study, and each instructor had at least one class offered with virtual office hours and one class without. Thus, the impact of instructor's individual teaching style on the utilization of office hours was carefully considered and well-controlled.

The research data was collected throughout the academic semester. At the beginning of the semester, students in all five classes included in the study were surveyed (see Appendix 1) to investigate following issues: demographic information of students; students' experience and possible issues with traditional office hours; students' need for virtual office hours and students' preferences on software tools for virtual office hours.

During the semester, virtual office hours were offered in addition to traditional office hours in three of the five participating classes. The virtual office hours were implemented using a popular instant messaging (IM) tool available as part of the social networking Website, Facebook. This was due to two reasons: first, many students

are very familiar with Facebook's IM client. In the pre-study survey, 56.8% of participants stated that they preferred the Facebook IM client to other commonly used online chat systems. The instructors further created a tutorial about how to use Facebook IM client to help the students who were not familiar with the IM tool. Second, Facebook's IM client is easy to use and Web-based, so students can access the system from any Web browser and did not need to install additional software on their computers. By using a familiar and easy to set up IM client that many students were already accustomed to, we felt that participation in the study would be higher than if a different IM tool was utilized.

The virtual office hours were set to a one-hour session in a weekday evening for all participating classes. Almost 62% of respondents in the pre-study survey stated they preferred the evening time. During the virtual office hours time, the faculty was signed on and available on Facebook and students could log into their account and communicate through Facebook's online chat system. The students could also make a virtual appointment with their instructor and setup additional time for an online chat session. The students' utilization of both traditional office hours and virtual office hours (as applicable) were recorded during the semester.

At the end of semester, a post-study survey was administered to assess students' experience with using office hours. The post-study survey had two versions: version 1 (see Appendix 2a) was administered in classes with virtual office hours and focused on students' satisfaction with virtual office hours and office hours in general. Version 2 (see Appendix 2b) was administered in classes without virtual office hours and it investigated both students' satisfaction with, and issues related to, the utilization of office hours. For both the pre-study survey and post-study surveys, students' satisfaction with office hours in general was assessed with a global measure of satisfaction using a five point Likert-type scale with anchors ranging from "least positive" to "most positive." The use of a global measure of satisfaction is consistent with previous studies of student satisfaction (e.g., Roszkowski and Ricci, 2005; Yang, 2003).

5. RESEARCH RESULTS

5.1 Students Demographic Information

Eighty-nine students participated in the study (see Table 2). The majority (over 95%) of participants were juniors and seniors with 54% male and 46% female. Most of the participants in the study were young (64% were 20-25 years old and 21% were 25-30 years old). Over 83% of participants held a job outside of the classroom. In the

Class	Daytime classes	Evening classes
Classes with virtual office hours	18	20
Classes without virtual office hours	29	22

Note: The totals participants are from pre-study survey. The number of students who participated in the pre-study survey and post-study survey are slightly different.

Table 2. Total Participants by Class Type

evening classes, over 93% of participants were employed full-time compared to 75% of participants in the daytime classes.

5.2. Students’ Experience with Traditional Office Hours

Based on the results of pre-study survey, students’ experience with traditional office hours in their prior classes was not very good. On average, they rated their satisfaction with their prior experience with office hours 3.6 out of 5 (on a scale of 1= least satisfied and 5= most satisfied). The major reasons that students stated that prevented them from using traditional office hours effectively are listed in Table 3. The top issues were “office hours were not convenient,” and that they “do not have time to see the professors during the traditional office hours.” This is not very surprising considering 83.1% of participating students work either full-time or part-time. Students were very acceptable to the idea of virtual office hours: 85.4% of students wanted to have virtual office hours offered in their classes. This finding creates motivation for faculty to offer alternative means of communication and interaction for students outside of the traditional classroom.

In addition to the finding that students desire access to their professors beyond the traditional classroom environment, 95.5% of students stated they had access to computers and Internet at home with the remaining 4.5% having access either at work or at school. Over 94% of the students also stated they had used some of the popular instant messaging tools. Overall, the pre-study survey results indicated there was clearly a need for virtual office hours, and that students were technically ready for communicating with their professors in an online environment.

Key Issues with Utilization of Office Hours	Percent
A. The office hours are not convenient for me.	66.3%
B. I don’t have time to see the professor during his/her office hours.	51.7%
C. Professors are sometimes not available during office hours.	22.4%
D. It is difficult to schedule a time with the professor outside his/her office hours.	15.7%
E. I often study or have classes at night and/or no office hours are offered in the evening.	14.6%

Table 3. Key Issues Preventing Students from Using Office Hours Effectively

5.3. Students’ Utilization of Virtual Office Hours

Table 4 shows students’ actual utilization of office hours and other types of types of student-faculty interactions, such as

before/after class visits, emails, and bulletin board postings, etc. As expected, there were relatively few traditional office hour visits reported. This finding was consistent with participants’ survey responses at the beginning of the semester that indicated that traditional office hours are generally not convenient for them.

Interestingly, the utilization of virtual office hours was also limited. Technology was not a factor because most students indicated they had access to computers and were familiar with instant messaging software. The pre-study survey data indicated that over 94% of respondents had prior experience with an IM tool. Further, 56.9% of daytime students and 56.8% of evening students stated they preferred using Facebook online chat as the IM tool. There was, however, a significant difference in students’ literacy in using an IM client between daytime and evening students.

One possible explanation is that students did not find the need to use the virtual office hours. From the results of post-study survey, we found that 45.1% of students usually do not have questions because the course Website contains sufficient information. When they did have questions, 61.3% of students got their answers or problems resolved via email, before/after class visits or other means of student-faculty interaction. A small percent of respondents (13%) felt that the time the virtual office hours were offered was not convenient for them. However, the number is significantly less than the number of respondents who reported that the times for traditional office hours (66.3%) were inconvenient. Students were provided the option of scheduling a specific time for a virtual appointment, consistent with the option using traditional hours. Thus, the results suggest the setup of virtual office hours was not the cause of the low level of utilization.

Another reason participants reported low regular and virtual office hour visits was that, when they needed class-related assistance, their first response was to use other means of student-faculty interaction methods such as email, before/after class visits, etc. instead of engaging in the synchronous chat option. As indicated in Pre-study survey, when students had a question related to the class, they preferred to email the professor of the course (57.3% of responses) or ask the question before or after class (24% of responses). Only 11% of the students choose to stop by the professor’s office during office hours. The students’ preferences are confirmed by the large number of email exchanges and bulletin board postings for each of the classes as shown in Table 4.

In terms of utilization of virtual office hours, only three students from the daytime classes accessed the chat function during the scheduled hours. For the evening classes, although many students joined the Facebook group to

Class	Number of Students	Virtual Office Hour Visits	Regular Office Hour visits	Before/after Class Visits	Emails	Discussion Board Postings
Class 1 (daytime)	12	1	1	3	39	35
Class 2 (daytime)	6	2	1	2	27	28
Class 4 (evening)	29	0	2	3	40	12
Class 3	20	N/A	1	4	10	6
Class 5	22	N/A	1	5	102	30

Note: N/A – the class was not offered with virtual office hours.

Table 4. Students Usage of Office Hours and Other Types of Class Interactions

participate in the virtual office hours sessions, there were no students who actually initiated questions to the professors. Thus, there is more usage of virtual office hours in daytime classes than in evening classes. Even though we cannot make a statistical conclusion due to the small number of virtual office hour visits, it is clear that students in evening classes did not utilize virtual office hours more than traditional students. The results did not support hypothesis 1, which predicted that evening or nontraditional students are more likely to use virtual office hours than daytime or traditional students.

5.4. Students' Experience with Virtual Office Hours

The students' satisfaction with office hour's data we collected from the pre-study and post-study surveys are listed in Table 5. The pre-study data are students' experience with office hours in their previous classes and the post-study data are students' satisfaction of office hours in their current classes. Thus, those data are not directly comparable. The pre-study data showed there is no significant difference between classes offered with virtual office hours and classes offered without virtual office hours in terms of student satisfaction with office hours. This demonstrated that there is no bias with students' office hours experience prior to the study.

Based on the post-study data collected at the end of the semester, the average satisfaction of participants in classes that offered virtual office hours was higher than the classes without virtual office hour setting: 4.55 vs. 4.17. As shown in Table 5, the average student satisfaction of each class with virtual office hours was higher than the average of any class without virtual office hours. We further conducted a t-test (two-sample assuming unequal variances) on the students' individual satisfaction value between classes with virtual office hours and classes without virtual office hours. The two groups were significantly different ($\alpha = 0.1$, $p = 0.074$, one-tail test). Thus, Hypothesis 2 is supported.

	Class	Pre-study Survey	Post-study Survey
Classes With Virtual Office Hours	Class 1	3.53	4.33
	Class 2	3.86	5.00
	Class 4	3.28	4.33
	Average	3.56	4.55
Classes Without Virtual Office Hours	Class 3	3.43	4.10
	Class 5	3.89	4.24
	Average	3.66	4.17

Note: Student satisfaction is based on the scale of 1-5: 1 = least satisfied, 5 = most satisfied

Table 5. Comparison of Student Satisfaction with Office Hours

In this study, we also investigated students' overall perception of virtual office hours. As shown in Table 6, participants in general were very positive about having access to virtual office hours regardless of whether they actually utilized the option. Even though they seldom accessed the virtual office hours during the scheduled times, they liked having the opportunity available, considered it a good addition to the class, and expected to have and use virtual office hours in their future classes.

Items	Score
A. Virtual office hours offered in this class are useful	4.33
B. Virtual office hours are a good addition to regular office hours	4.49
C. I'd like to have virtual office hours in future classes	4.59
D. I would be more likely to use virtual office hours in future classes	4.39

Note: Students' score is based on the scale of 1-5: 1 = least agreement, 5 = most agreement

Table 6. Students' Perceptions of Virtual Office Hours

6. DISCUSSION AND CONCLUSION

6.1 Summary of Results

In this paper, we conducted a survey-based study measuring traditional and nontraditional students' utilization of virtual office hours, and their overall satisfaction with office hours in general. Our research findings suggest that participants in general were not satisfied with traditional office hours, citing convenience and accessibility as the most common reasons. Participants in the study, however, responded positively to having additional access to their professor through the option of virtual office hours. These findings were consistent with our predictions that, despite the limited utilization of virtual office hours, students in classes that offered the additional hours of access would have higher levels of satisfaction.

In our study, we hypothesized that nontraditional students who were employed full-time and attend class either full-time or part-time would utilize virtual office hours more than traditional students who attend classes full-time and do not work or only work part-time. Surprisingly, the opposite was true in our study. We cannot conclude that traditional students were more likely to utilize virtual office hours than nontraditional students. This may be due to three reasons: First, the student participation of virtual office hours is quite low and it's difficult to draw conclusion under this context. Second, there were a large number of working students in daytime classes (74.5%) which is not representative of traditional students. Third, even though the participating evening class had a higher (92.9%) percentage of nontraditional working students, the participants preferred other means of interacting with their professor than through a virtual environment. This may be due to the different needs of nontraditional students who may seek more human connectivity with their professors (Oomen-Early, et al., 2008). Further, as reported in previous sections, students in the participating classes generally did not have many course-related questions, and when they did, their preference was to send an email or see the instructor before or after class. These factors may have contributed to the small number of virtual office hours visits for all classes. Further study on this issue is needed.

Our second hypothesis predicted that students in classes that offered virtual office hours would have higher levels of satisfaction than in classes that did not offer virtual office hours. Consistent with our prediction, we found that the option of virtual office hours had a positive impact on students' satisfaction; the average satisfaction value for classes with virtual office hours was significantly higher than the classes without virtual office hours. We did not find

significant difference on utilization of virtual office hours between traditional and nontraditional students. This could be due to large number of working students in both daytime and evening classes, and students in the participating class generally did not have many problems with the course content.

In summary, while most studies to date have focused on the use of synchronous communication in distance learning environments such as online classes, this research studied the value and impact of virtual office hours in traditional on-campus MIS courses. Our findings suggest offering virtual office hours may have a positive impact on students' satisfaction with student-faculty communications outside the classroom. To our knowledge, this research is one of the first studies to investigate the difference between traditional students and nontraditional students regarding the utilization of virtual office hours. While we did not find a significant result due to the student characteristics in the participating classes, this generates an interesting area for future study.

6.2 Research Limitations

There are a couple of limitations in this research: first, the participating classes were taught by two different faculty members. Their individual teaching styles may have influenced the participants' responses although we tried to keep the impact to a minimum; second, there was a large number of working students in both the daytime and evening classes. This makes it difficult to differentiate between traditional and nontraditional students in terms of how they perceive the benefits of utilizing virtual office hours. As more universities and colleges initiate distance learning courses and embrace computer-mediated communication technologies, it will be more feasible to better define and differentiate the various types of students and their communication and interaction preferences and needs.

Although our findings did not show high levels of utilization of virtual office hours, it is evident students see potential value in the opportunity to interact with their professors outside the boundaries of the traditional office and classroom environment. Past studies have confirmed the positive student outcomes that accrue from students interacting frequently with their professors (Arbaugh, 2001; Nadler and Nadler, 2000; Wingard, 2004; Cotten and Wilson, 2006). As faculty become increasingly more proficient in the use of computer-mediated communication, its value in extending the boundaries of the traditional classroom may become even more apparent.

6.3 Research Implications

There are several implications for faculty designing courses using virtual office hours as a teaching and learning tool generated from this research. First, virtual office hours are not only an important communication tool for online courses, but also a good addition to traditional on-campus classes. Second, as our findings suggest, offering virtual office hours, regardless of utilization levels, creates a positive impact on the students' satisfaction level with office hours in general. Consistent with earlier studies (Arbaugh, 2001; Bippas, et al., 2003), having professors who are perceived as accessible and willing to help beyond the requirements of the course may increase students' overall level of satisfaction with the course and learning environment.

While the purpose of virtual office hours is to provide flexible and convenient student-faculty interaction outside classroom, our study found that students usually prefer other means of student-faculty interaction such as email rather than using traditional or virtual office hours. Instructors that create content-rich course Websites may reduce many students' questions proactively, and answering students' email on time and posting course-related materials online may improve the students' overall satisfaction with the class.

A key consideration for faculty evaluating the use of virtual office hours is that student expectations for faculty availability and access may have negative consequences in terms of the time and effort required to manage extensive communication dialogues (Farmer, 2003; Jeong, 2007). As students become increasingly more familiar with the "virtual classroom," they may view virtual office hours as merely an expected and normal extension of the classroom environment (Farmer, 2003). Successful integration of computer-mediated communications into college courses will require that faculty design and use these new Web-based communication tools appropriate to the context and goals of the class. The adoption of Web-based communication and collaboration technologies, in particular, Web 2.0 tools such as blogs, wikis, and podcasts are becoming increasingly popular in educational venues primarily due to their ease of implementation and use (Boulos, Maramba, and Wheeler, 2006). In a recent article in the *Chronicle of Higher Education's* e-Newsletter, Young (2008) discussed the use and benefits of another emerging Web 2.0 technology, Twitter (2009), in the academic environment. Similar to IM, Twitter is a Web-based communications tool that can facilitate classroom interaction and help build a sense of community among students. Twitter also provides increased opportunities for faculty to interact with students by sending brief class-related reminders and updates, or posting interesting links to course related material.

6.4 Conclusion and Future Research

Web 2.0 technologies offer faculty and students new opportunities for collaboration and communication outside of the traditional classroom environment. The benefits of informal student-faculty interaction is well-established in the literature (e.g., Endo and Harpel, 1982; Kuh, 1995; Nadler and Nadler, 2000; Kuh and Hu, 2001) with studies consistently finding that students are more likely to be satisfied with their college experience and have higher levels of persistence when they feel connected to their professors and other students (Pascarella, 1980; Ku and Huh, 2001; Cotton and Wilson, 2006). The traditional practice of office hours, the primary source of student-faculty interaction outside the classroom, however, may be unrealistic for reaching students in today's educational environment.

In this study, we explored the utility of using IM for virtual office hours as a supplement to traditional office hours and found that even with the availability of convenient and easy-to-use communication technology, students were not inclined to initiate interaction with their professors. Our study suggested several directions for future research. First, there is a need to better understand the difference in communication needs of traditional vs. nontraditional students. Second, the utilization of synchronous communications technologies such as IM and Twitter are

predicted to grow as universities and colleges continue to expand their distance courses offerings. As professors increasingly utilize Web 2.0 technologies in their courses, it will be important to understand the appropriate uses of various technologies and how to integrate them effectively into the classroom environment. Finally, in this study, students preferred email as their primary source of communication with their instructor. It would be important in future studies to better understand the factors that contribute to students' utilization of different communication technologies to ensure the appropriate technologies are leveraged effectively in the course.

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**Appendix 1
Virtual Office Hours Pre-study Survey**

1. Where do you have access to computers and Internet? (*You may check multiple answers*).
 A. at home
 B. at my workplace
 C. at campus
 D. Other (please specify): _____
2. What do you first do when you have a question related to the course or need help outside the classroom? (*Check one answer*).
 A. Call the professor of the course
 B. Email the professor of the course
 C. Stop by professor's office during office hours
 D. Make an appointment with the professor
 E. Ask the question before the class starts or after the class ends
 Other (please specify): _____
3. On scale of 1-5 (*1- least positive, 5- most positive*), evaluate your general experience with office hours in your previous courses. (*Circle your answer*).

Least positive 1 2 3 4 5 Most Positive
4. What are some of the potential issues that may prevent you from utilizing office hours offered by your professors effectively? (*You may check multiple answers*)
 A. The office hours are not convenient for me
 B. Professors are sometimes not available during office hours
 C. It is difficult to schedule a time with the professor outside his/her office hours
 D. I often study or have classes at night and no office hours are offered at night
 E. I don't have time to see the professor during his/her office hours
 F. Other (please specify) _____
5. Are you interested in having virtual office hours in the class (the professor can answer your questions using an Instant Messenger (IM) system)? YES /NO (*Circle your answer*).
6. If the answer to question 6 is YES, what time of day would you prefer for virtual office hours? (*Check one answer*)
Morning ___ Afternoon ___ Night ___ No preference ___
7. Which Instant Messenger (IM) (online chat room) system do you use most often? (*Check any that apply*)
 A. Facebook or MySpace
 B. Windows Live Messenger (MSN Messenger)
 C. Yahoo Messenger
 D. Google IM
 E. CougarView chat room
 F. Other (please specify) _____
 G. I have never used an Instant Messenger system.

Appendix 2a

Virtual Office Hours Post-study Survey (For Classes Implemented with Virtual Office Hours)

1. Classification (circle one): Freshman Sophomore Junior Senior
2. Gender (circle one): Male Female.
3. Age (circle one): <20 20-25 25-30 30-35 >35
4. GPA(circle one): <2.0 2.0-2.5 2.5-3.0 3.0-3.5 >3.5
5. Job status (circle one): Part time Full time Not working
6. On scale of 1-5 (1- least positive, 5- most positive), evaluate your general experience with office hours in this course. (Circle your answer).
Least positive 1 2 3 4 5 Most Positive
7. Did you ever use virtual office hours? (check one answer): YES NO
- 7.a If your answer of question 8 is YES, on scale of 1-5 (1- least positive, 5- most positive), evaluate your general experience with using virtual office hours in this course. (Circle your answer).
Least positive 1 2 3 4 5 Most Positive
- 7.b. If your answer of question 8 is NO, why didn't you take advantage of virtual office hours?
 A. The virtual office hours are not convenient for me
 B. Professors are sometimes not available during virtual office hours
 C. I'm not familiar with using Facebook.com for virtual office hours
 D. The course website contains sufficient information and I generally don't have questions
 E. I usually get my problem solved by other ways such as emails, before/after class, etc.
 F. Other (please specify) _____
8. What are your overall expressions about the virtual office hours offered in this class? (check your answer for each item, (1- least agree, 5- most agree).
A. Virtual office hours offered in this class are useful 1 2 3 4 5
B. Virtual office hours are a good addition to regular office hours 1 2 3 4 5
C. I'd like to have virtual office hours in future classes 1 2 3 4 5
D. I'd be more likely to use virtual office hours in future class 1 2 3 4 5

Appendix 2.b

Virtual Office Hours Post-Study Survey (For Classes That Did Not Implement Virtual Office Hours)

1. Classification (circle one): Freshman Sophomore Junior Senior
2. Gender (circle one): Male Female.
3. Age (circle one): <20 20-25 25-30 30-35 >35
4. GPA (circle one): <2.0 2.0-2.5 2.5-3.0 3.0-3.5 >3.5
5. Job status (circle one): Part time Full time Not working
6. On scale of 1-5 (1- least positive, 5- most positive), evaluate your general experience with office hours in this course. (Circle your answer).
Least positive 1 2 3 4 5 Most Positive N/A (did not use)
7. What do you do when you have a question related to the course or need help outside the classroom? (you may check multiple answers).
 A. Call the professor of the course
 B. Email the professor of the course
 C. Stop by professor's office during office hours
 D. Make an appointment with the professor
 E. Ask the question before the class starts or after the class ends
 F. Other (please specify): _____
8. What are some of the issues that prevent you from utilizing office hours offered by your professors effectively? (You may check multiple answers)
 A. The office hours are not convenient for me
 B. Professors are sometimes not available during office hours
 C. It is difficult to schedule a time with the professor outside his/her office hours
 D. I often study or have classes at night and no office hours are offered at night
 E. The course website contains sufficient information and I generally don't have questions
 F. I usually get my problem solved in class
 G. Other (please specify) _____



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