

## **Increasing Student-Teacher Interactions at an Urban Commuter Campus through Instant Messaging and Online Office Hours**

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### **Abstract**

Encouraging first year undergraduate students in large lecture-hall classes to seek out and actively engage their professors is a perennial problem in science education. This problem is especially acute for commuter and minority populations. Thus, because personal relationships between students and professors are well known to promote student learning and academic success, fostering new ways to connect students and faculty is essential for reducing attrition at inner-city colleges. In the current study, we demonstrate that the use of instant messaging (IM) is highly effective in fostering student-teacher interactions in the lecture-hall setting of an introductory major-level biology course at John Jay College of Criminal Justice, a senior college within The City University of New York. We found that not only did the use of IM allow more students to directly contact their professors through the internet, but also formed the basis for a personal relationship, leading to increased *in-person* interaction during office hours. This argues that new internet-based communication technologies can help break down barriers between students and professors at the undergraduate level. We also discuss some of the further enhancements that are possible given these preliminary successes with IM. Clearly, increased use and development of Instant Messaging can play a vital role in the active engagement of students in the learning process.

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### **Introduction**

It is well established that post-secondary students benefit significantly from routine communication with their professors (Brophy and Good, 1974, Cooper and Simonds, 1999). At the college level, student-teacher communication is about much more than simply answering content questions, clarifying subject material, or improving skills performance. Rather, student-teacher communication is also about building relationships between students and their professors (Lampton, 1993). These personal relationships convey to students a sense of empowerment and mutual investment in their education, which can lead to increased effort, determination, and drive (Crosnoe et al., 2004, Ellsworth, 1997). Student-teacher relationships can grow into true mentoring, which provides students with role models, academic and career counseling, and guidance (Erkut and Mokros, 1984, Jacobi, 1991). Thus, it stands to reason that the building and

fostering of student-teacher relationships early in the college experience can yield substantial returns in the retention and academic success of beginning college students.

However, nurturing student-teacher interactions is notoriously difficult in the impersonal setting of large, lecture hall-based courses, such as are often found in introductory science courses (Ebert-May et al., 1997). Without a basis for interaction, undergraduate students rarely feel comfortable approaching their professors during office hours (Cotten and Wilson, 2006). The outlook is even worse among urban and commuter populations, and many commuter students go through their college experience never having even one personal interaction with a professor (Pascarella et al., 1983, Saenz et al., 1999). Because student-teacher relationships are well known to promote retention and academic performance among engaged students (Burrowes, 2003), it is critically important to find new ways to foster these interactions and personal relationships among students and faculty at urban colleges. Tragically, colleges and universities that serve minority, underrepresented, and financially disadvantaged students also exhibit the greatest barriers to the development of programming designed to build student-teacher relationships (Chang, 2005, Saenz et al., 1999, Bordes and Arredondo, 2005, Goddard, 2003). This disturbing trend might only be reversed by creative engagement of students by faculty at urban, commuter, and minority-serving campuses.

Fortunately, the proliferation of the internet brings with it endless and inexpensive possibilities for doing just that (Wegner et al., 1999, Jones and Madden, 2005). The technology of internet-based “instant messaging” (IM) is one potential new means to bring professors and students together in the information age. Several reports have already detailed how IM has been successfully implemented in professor office-hours, encouraging students to be more confident when interacting with their professors (Berger, 1999, Mock, 2001, Frees and Kessler, 2004). In one study, distance learning students that contacted their professors using IM reported that it was easier to communicate with their professor and reported a stronger sense of community than those that did not use IM (Nicholson, 2002). In another study reporting enhanced learning in an online version of a Shakespeare course, the author cited the intimacy of electronic communication (Instant Messaging) as the single most important factor responsible for the learning gains (Koory, 2003). Thus, instant messaging could provide an important new interface for student-teacher contact, which in turn serves as a basis for building relationships. However, while many have written favorably regarding the use of Instant Messaging to reach students (Wegner et al., 1999, Nicholson, 2002, Levin et al., 2001, Wallace and Wallace, 2001), relatively few quantitative studies of this electronic interaction, and its effect on relationship building, have been reported.

Instant messaging is a form of real-time communication involving two or more people over a network, such as the internet (world wide web) or a local working group or intranet (Nicholson, 2002). Communication is usually text-based, occasionally integrating animated graphics known colloquially as “emoticons” or “smilies,” e.g., :). It is often considered more similar to actual conversation than is e-mail (Nardi et al., 2000). Most instant messaging protocols allow the users to leave the program open and set a status which displays to other users their availability to engage in conversation. Instant messaging programs (also called clients) often use what is known as a “contact list” as

their main window. A contact list is a list of the user's friends or contacts organized according to manually set groups or by their availability status. The main window can run in the background of most operating systems. The contacts will usually be displayed using some form of ID such as their username, their e-mail address, or their "nicknames" or display names.

The program designs of all instant messaging programs are very simple to execute, even for novice computer users (Nardi et al., 2000). First, in order to engage in conversation with one of his/her contacts, the user must open a chat window for that contact, usually by double-clicking on that person's entry in the list. Once that chat window is open, an area for entering text can usually be found on the bottom half of the window, with a "send" button nearby. (Also, usually pressing the "Enter" key on the keyboard performs the same function as the send button.) The actual conversation is displayed in another area, generally on the top half of the window. Other features in this window may include some form of a custom display image representing each user, termed an avatar. Also, this window will usually have the option to start a live voice and/or video conversation, which requires microphones, speakers, webcam, or any combination of these.

Many instant messengers or IM clients have their own mobile counterparts, which are reduced basic versions of those used in laptops or personal computers. Mobile instant messengers are compatible with PDA's or cellular phones (Nardi et al., 2000, Baron, 2005). There is a wide variety of IM clients available, most of which use their own proprietary IM protocols. Among the most popular clients with proprietary protocols are AOL Instant Messenger with 53 million active users, Microsoft Windows Live Messenger with over 330 million active users, and Yahoo! Messenger with >25 million active users ([http://en.wikipedia.org/wiki/Instant\\_messaging\\_%26\\_messengers#User\\_base](http://en.wikipedia.org/wiki/Instant_messaging_%26_messengers#User_base)). Multi-protocol clients such as Pidgin and Trillian can use any of the popular IM protocols, in order to consolidate their contact lists from multiple clients into one main window.

### Method of Study

We decided to test whether instant messaging could be used to foster student-teacher interactions at an inner-city commuter campus. This study took place in three introductory biology courses for forensic science majors consisting of 110 total students in John Jay College of Criminal Justice, a senior college within The City University of New York (CUNY). Located in Manhattan, John Jay College draws widely on the inner-city, lower-income minority populations throughout all five boroughs of New York City and nearby suburbs (<http://www.jjay.cuny.edu/>). Attending a commuter school, John Jay students often lack the essential on-campus time needed to engage their professors one-on-one, whether the discussion is focused on topics pertaining to the course or simply casual conversation. Thus, the implementation of online office hours through IM could give those students more time, either during regular work hours or virtually any other time, to consult with their professor directly and privately. The present study took place during the fall semester of 2006 and office hours contact time was carefully monitored throughout the semester.

Even after the first two exams of the semester, students were reluctant to see the course professor during office hours, resulting in only 1.75 contact hours among four (4) different students across the three courses. This could have been the result of many factors; among the most relevant is the fact that students may have not felt comfortable to approach the professor due to the impersonal atmosphere of the large lecture hall in which the courses met. In exams that had a score of below 50%, the professor addressed those students with a note soliciting them to see him in his office. Most students still did not do so.

In order to have more contact with his students, the professor decided to create an IM screenname using AOL instant messenger (JJDrLents) and announced it to his students during class during the last weeks of October. Professor Lents signed in to the AOL Instant Messaging (AIM) service during his regularly scheduled office hours, as well as periodically during the evenings, particularly as exams were approaching. The flexible schedule for online interaction was important, considering that many students from John Jay come from low-income families, and don't always have unlimited access to the internet. Thus, many students were likely to utilize the online office hours while in the JJC computer labs or other public internet access points. After students added the screenname to their contact list, the professor continued to log student contact time, now including "online contact hours" achieved through IM.

### Results

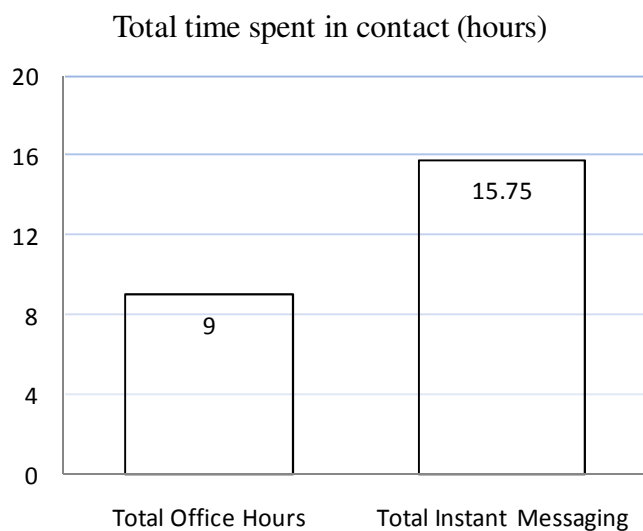
During the period of the semester after introducing Instant Messaging, students gradually began to engage the professor in conversation online. As table one shows, 24 different students contacted Professor Lents via IM at least once during the two months remaining in the semester. In 38 different online conversation sessions, Professor Lents logged nearly 16 hours of one-on-one contact time with students. By comparison, Professor Lents had spent less than two hours directly talking with four different students during office hours in the two months prior to the introduction of IM.

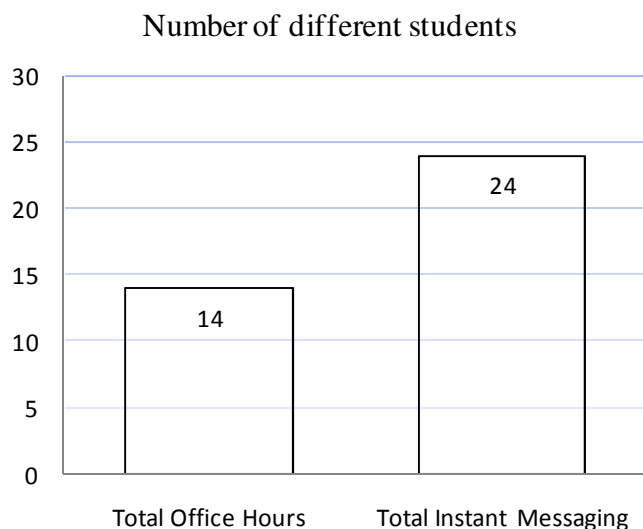
Table 1

Student-teacher contact hours, via instant messaging or in office hours (before or after instant messaging was introduced), as indicated.

	Office Hours (before IM)	Office hours (after IM)	Instant Messaging
Total time spent in contact (h)	1.75	7.25	15.75
Number of contacts / visits	5	14	38
Number of unique students	4	10	24
Average time per visit (m)	21.0	31.1	24.9

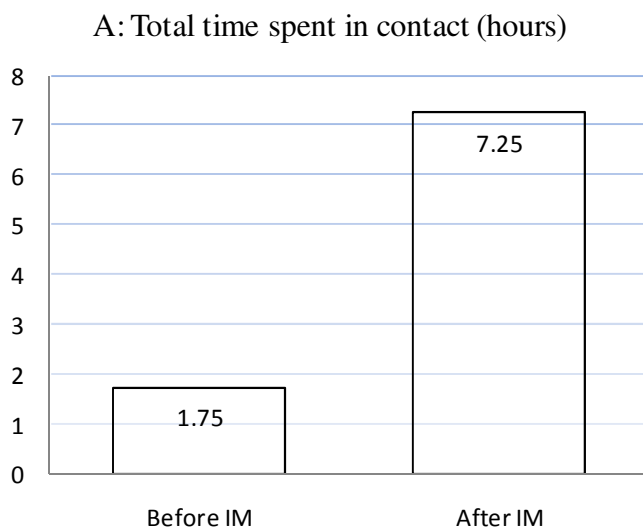
Figure one further demonstrates, by three different metrics, how students more actively engaged their Professor through IM than through the traditional in-person visit during office hours. The upper left panel of figure one shows the total amount of time the students spent in contact with Professor Lents both in person and online. The amount of time students spent in contact through IM was almost 16 hours, whereas students in person spent 9 hours in contact. The upper right panel of figure one compares the number of individual times that students actually contacted the professor, both online and in person: Dr. Lents was contacted by students 19 times in person and twice as much online. The bottom left panel in the figure shows the amount of unique students that contacted Dr. Lents, being 14 in person and 24 online. Thus, Instant Messaging is clearly an effective means by which professors and students can engage in one-on-one interaction, even when students may have been reluctant to reach out for personal interaction otherwise.



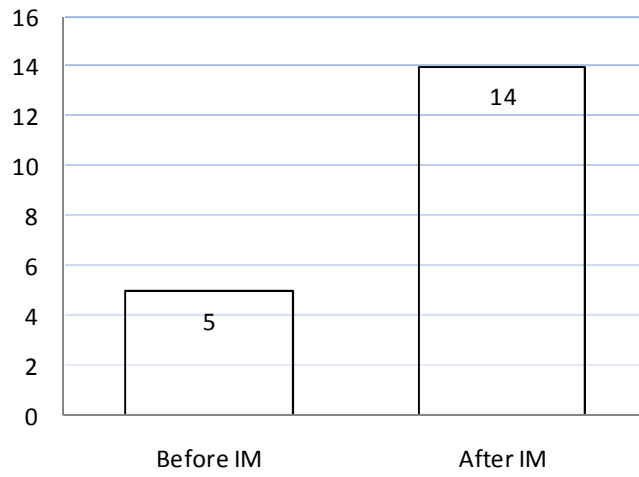


*Figure 1.* Student-teacher contacts, instant messaging vs. in-person office hours, as indicated. Upper left panel, total contact hours; upper right panel, total number of contacts or visits; lower left panel, number of unique students in contact with the professor.

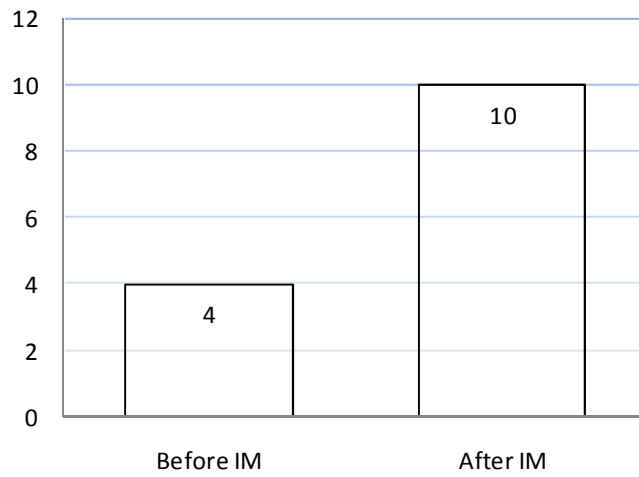
Incredibly, the increase in student-teacher contact was not limited to Instant Messaging. As students became more comfortable approaching their professor through IM, the in-person contact improved as well. Figure Two demonstrates the differences seen in *in-person* office hours contact time observed before and after IM office hours were implemented. Panel A shows the total contact time spent with students during office hours before IM was 1.75 hours and 7.25 after IM.

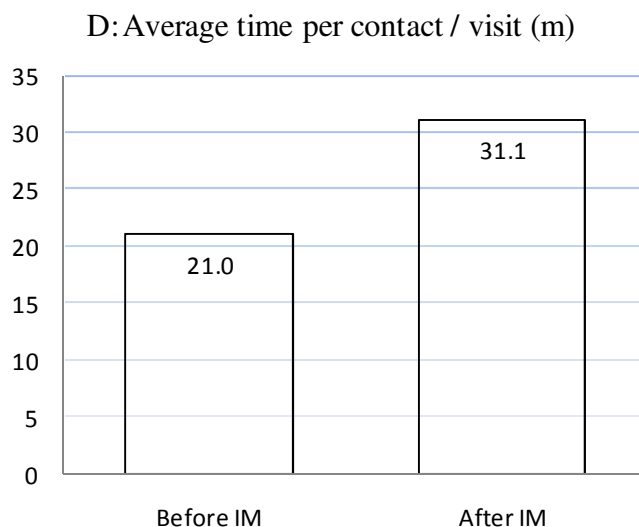


B: Number of contacts / visits



C: Number of unique students





*Figure 2.* Student-teacher contacts during office hours, before introducing instant messaging vs. afterward. A) Contact time with students. B) Number of individual student visits to office hours. C) Number of individual students seeking contact time with the professor. D) Average time (m) per office hour visit.

Importantly, IM was introduced at the midpoint of the semester, so there was roughly equal amounts of calendar time in the “before IM” and “after IM” categories. Panel B shows that the number of times students contacted Dr. Lents in his office hours before IM was implemented was just five (5), but this number jumped to 14 after IM was introduced. Panel C shows us that 10 unique students contacted the professor in person after the implementation of IM, while only 4 had done so before. Dramatically, 9 of those 10 had previously contacted the professor through IM, before visiting during office hours (data not shown).

Further, the average amount of time spent in contact per visit was 21 minutes before IM was implemented and 31 minutes after, as seen in panel D. Although one could argue that this study was biased by having the “after IM” time period occurring in the second half of the semester, when concern with course performance may be greater, Professor Lents has not seen, previously or since, such a difference between the first and second half of the semester, let alone one so dramatic. Clearly, the introduction of IM was the key difference in enhancing student-teacher interaction.

### Discussion

Student-teacher relationships help promote retention and improve academic performance among students (Cotten and Wilson, 2006). Fostering these relationships is especially difficult among urban commuter schools such as John Jay College. Instant messaging can significantly expand student-teacher interactions by providing a more informal and comfortable setting in which students can approach their professors (Contreras-Castillo et al., 2006). The present study involving instant messaging as a



method of professor office hours took place with students from introductory biology courses for forensic science majors in order to test if this form of student-teacher interaction would encourage the students to reach out more to their professor. Data from this study suggest that if properly implemented, IM will encourage students to approach their professor with more confidence in both themselves and the professor and can increase student interest and success in the course.

Not surprisingly, the vast majority of IM communication was directly related to course content or a specific question from a student, especially in a first contact. However, following the answering of the question and/or in second or third IM sessions, the conversation content became more casual and friendly, touching on the larger subject of biology or the course of study (forensic science). This critical transition point often marks the beginning of a personal relationship and it is our hypothesis that these IM relationships can and often do develop into in-person relationships. On more than one occasion, students casually inquired as to the career path of the professor and his area of active research. Conversations such as these can open the door to mentoring and role modeling. At the same time, there were also multiple occasions where IM conversations tended to drift away from course content on tangents that were not conducive toward mentoring. Thus, professors that use IM to communicate with students will need to establish gentle means to cut off irrelevant conversations that might do nothing but waste both students' and professors' time, without scuttling future conversations with the involved student.

By the end of the current experiment with IM, both the amount of time that students remained in contact and the number of individual students that came to meet with the professor increased. Surprisingly, this increase was not just present among the online contacts, but also among the in-person contacts. Because all but one of the individual students that came to see the professor in his office had previously contacted him through IM, this provides strong evidence that IM can break personal barriers in large urban campuses, and lead to closer connections between professors and teachers. This, in turn, could lead to an increase in student perception that their instructors are invested in them and their academic success. And, because perception of faculty investment can enhance student investment in their own learning (Endo and Harpel, 1982, Lundberg and Schreiner, 2004), it is not unreasonable to expect that institution-wide adoption of Instant messaging and online office hours by faculty could result in measurable gains in student performance, retention, and graduation.

### Looking Ahead

There are many alternative ways to implement online office hours using instant messaging (Farmer, 2003, Mock, 2001, Nardi et al., 2000, Baron, 2005, Contreras-Castillo et al., 2006). Multiple students can join their professor in an online chat room or group conversation, where they can all ask questions and take note of the questions their classmates may ask. Because an IM display names need not reveal the bearer's identity, students have the option of remaining anonymous during these interactions. [In this study, although students were told that they did not have to provide their names, perhaps surprisingly, none chose to maintain anonymity.] Also, with all the technology and

features available in instant messengers, students can have voice and/or webcam conversations with their professors and their classmates to form an online study session. One can easily envision online review sessions with voice and video webcam, that students may pose questions, using text or voice, and the professor can answer the questions in his/her own voice, using the chalkboard, diagrams, models, or other visual aids.

At commuter campuses such as JJC, when exam review sessions are conducted outside of scheduled class time, they are, in general, very poorly attended, owing in large part to the time and effort required for students to return to campus after-hours. Worse, these review sessions may favor the fortunate few that do not have to work, take care of relatives or children, etc. Thus, as broadband access to the internet becomes more universal, many obstacles that students face in taking full advantage of educational opportunities will erode. However, before professors will attempt such technological enhancement, they must first be convinced of the power of the internet in reaching students. We hope that the present study will help to do just that – demonstrate that the use of internet Instant Messaging has the power to dramatically increase student-teacher interactions. These interactions can then form the basis of a personal relationship that often leads to better student performance and learning. And the simple text-based Instant Messaging used in this study is just the beginning. Future studies will involve chat rooms, webcam-broadcasted review sessions, and more. These innovations do not change the content or pedagogy of a course. Rather, they simply help that content and that pedagogy to actually reach students.

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