

INSTANT MESSAGING

Expanding Your Office Hours

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Over the past 10 years we have witnessed amazing changes in communication, specifically regarding the rise of the Internet in everyday communications. All professors, new and old, know about e-mail, and many know how to access journal articles via electronic means. But faculty over the age of 35 may not know about instant messaging (IM). On the other hand, anyone under the age of 25 may not know of any other means of communication (such as how to write a letter and send it via the postal service). We offer below our experiences with IM as a means to “keep in touch with students” and expand our availability.

BACKGROUND

For those unfamiliar with the concept, instant messaging is different from e-mail in that the messaging is one-on-one and occurs in real time. For example, a graduate student from Italy used an instant messaging service to dialog with her sister daily while she was working in a laboratory in Boston. She would type a question, and approximately two minutes later her sister would reply. It is very similar to having a written conversation where a piece of paper is passed between two parties.

In IM, the questions and replies happen in real time. All IM services allow users to have a “friends list” of other IM users, and the service polls these friends in real time to let the user know whether or not they are “signed in” (online). Once signed in, the user can send a message to any other online user or receive a message from any user. Once a connection is established, a separate dialog box appears, and the two parties then send messages back and forth to each other. There is no limitation as to location; IM helps people keep in touch across town or across the planet, and has been used in such exotic locales as Antarctica and the Space Station.

► *The New Professor’s Experience* ◀

As a first-year professor teaching my first course, I (DB) was looking for ways to relate to students and provide them with as many means of getting help as they needed. The class was an introductory thermodynamics course in chemical en-

gineering with 28 students and was a mix of second- and third-year students, the vast majority of whom were native English speakers. The mixed nature of the course meant that students were coming with different experience levels as well as with wildly different schedules, which made finding times for traditional office hours challenging.

One of my TAs for the course, a seasoned graduate student and a veteran TA, mentioned that he often held “virtual office hours”—office hours where he had an online presence via an instant messaging service, such as America Online’s Instant Messenger (AOL AIM). He would often have these online sessions in the evenings, when students were likely to be tackling assignments and required guidance or had questions about problem sets. I was intrigued, and decided that I would also try having an online presence for students. Since assignments for the class were due Mondays and Thursdays, I decided to have a session on Sunday evening from 9 p.m. to 10 p.m. in order to try and catch last-minute questions for assignments on Mondays. My TA would have another session during the week to catch questions for the Thursday assignment set.

I had some previous experience with instant messaging. It had become popular when I was in college in the late ’90s—but as a communication tool among friends, not as a method of instruction nor as a means of enhancing student-instructor contact hours. I had a personal instant messaging account,

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but created a new one for the sole purpose of the class. I knew that my TA had had success with his online sessions, but he was a graduate student and closer in age and experiences to the students than I was. I had no idea if the students would actually feel comfortable enough to contact a professor in this manner.

I sat down for my first session on a Sunday evening, and my wife was convinced that I would be sitting there for an hour staring at a blank screen. How wrong she was!

Within seconds of signing on, I received my first message and my first question. Other students quickly followed, and within a few minutes, my screen had erupted in a flurry of new windows, each bearing a new question from a different student or group of students working together. I estimated that I had at least nine or 10 simultaneous conversations occurring in those first few minutes. To be honest, I wasn't prepared for that response, and my wife was amazed. She actually helped me get through that first evening by watching my screen and letting me know in what order the questions arrived. That enabled me to prioritize or tell people to hold on for a minute or two while I answered another student's question. The students were very patient, and very respectful of the time limit I had set, and before I knew it, the hour was up. I was drained and had cramped fingers from trying to type so fast, but I knew that I had hit upon something that the students responded to.

After that first session, I coordinated with my TA so that we were often on at the same time, enabling us to pass students back and forth between us and reducing the load on ourselves as well as speeding up the time it took for any one student to get a question answered. That first night was my heaviest load, but the students took advantage of my availability throughout the remainder of the semester.

In trying to gauge the success or impact of the online office hours, I asked the students to fill out an anonymous survey at the end of the semester, asking them about office hours in general. Out of 28 students in the class, I received 22 responses. When asked their office hours habits, the breakdown was as follows:

<i>Online Only</i>	9%	2 responses
<i>Online and Traditional</i>	50%	11 responses
<i>Traditional Only</i>	23%	5 responses
<i>Neither</i>	18%	4 responses

So, nearly 60% of the class took advantage of my online presence, either exclusively or as a supplement to my regular presence in the office during the day. Of those students that took advantage of the online hours, 77% found it an effective

way of getting their questions answered, while 23% did not.

When asked about the best feature of online office hours, nearly all students responded that it was my extra availability, as well as the convenience of being available at a time when they were likely to be working on problems. When asked about what they liked the least with regard to online office hours, again the response was nearly unanimous: the limitations of the forum.

I can understand these limitations well. While it is an excellent forum for discussing theoretical or conceptual aspects of the course or for having a personal conversation, the instant messaging format was not the best medium for conveying technical aspects of the course. Mathematical symbolism, for example, was particularly difficult to convey, as there was no easy or convenient way to write out an integral or a differential equation. The students and I often resorted to a sort of crude shorthand for mathematical notation which, while effective, was not ideal. For example, in a discussion involving fugacity, and which form of a particular equation to use, I would type

$$f_i(\text{hat}) = y_i * f_i$$

$$\text{Where } f_i = \phi_i(\text{hat})(i) * P$$

which the student would have to correctly interpret as

$$\hat{f}_i = y_i f_i$$

where

$$f_i = \hat{\phi}_i P$$

So, questions dealing with a particular equation, or trying to guide a student by looking at the form of an equation, could be awkward to answer in an IM window. The students were generally happy, however, to spend a little extra time typing and interpreting if it meant the difference between getting a question answered or spending a fruitless evening confused and working in the wrong direction.

The last question I asked them was whether the availability of online office hours made them more or less likely to attend traditional office hours. I only had 13 responses to this question, but it was interesting to me that while the majority said it made no difference (8 responses, 62%), the remainder (5 responses, 38%) said it made them *less* likely to attend regular office hours.

In the end, I found the experience to be a rewarding one. The students would often joke around a bit more online than they might in person, and I had some good conversations with students about their futures and concerns that had little

to do with the class or a problem set. Would this have happened in person? I'm uncertain; but, if those conversations helped students, then it was worthwhile. Given that a majority of students in the class took advantage of the additional contact hours, and that a majority of them found the experience useful, it is something that I planned to continue in my future course offerings.

Indeed, as of this writing, I have just completed another semester of teaching the undergraduate thermodynamics course, and my experience this time closely mirrored my original observations. Students were pleased to have the extra hours available to them, and took advantage of those hours on a regular basis.

► *The Old Professor's Experience* ◀

I (RJW: 20-plus years experience) first gained an awareness of instant messaging in January 2004 at a faculty recruiting dinner. The new faculty (DB) was talking about how well instant messaging was working for him running one of his office hours from his home on Sunday nights. The idea intrigued me since, for whatever reasons, students do not come to my office during my office hours.

After struggling with learning the ropes of IM (it took a few hours to download the software, figure out a user name, and figure out how to add "my friends"), I was ready for my first online session by mid-semester in February, and decided to try 8 p.m. Sunday night from my home. I had previously announced to the class that online office hours would be held that coming Sunday.

Within minutes, three students contacted me via instant messaging. Each had his/her own dialog box. The questions and messages were a little confusing to me at first. When one of them opened with a message similar to "How was your weekend?" my reply was a paragraph long, detailing a trip to New Hampshire, and took a full 15 minutes to type out. Meanwhile, other students were waiting for their replies. I quickly learned to cut my replies down to one sentence—I later realized that for "small talk" the students expected about a one-sentence reply.

The second surprise was how few technical questions I received. I was expecting questions related to the latest homework. Instead, only about one in every three or four questions was of this nature. I recall one question that was iterative in nature. The student who asked wasn't familiar with Excel Solver, so I was able to make up a quick spreadsheet example demonstrating such, and sent it via IM to the student.

What other students wrote was quite complex. Their questions and dialog ranged from jokes to personal family situations to serious self-doubt. They related much more to me than if they were sitting across from me in my office during a regular office appointment. I'd like to think that some of my replies made a difference.

Maybe, because I am so technically oriented, I lose awareness of students' personal needs, and when I sit across the desk facing students, I am perceived as their parent, or as an "old geezer," and therefore they are reluctant to share personal problems. Also, I must confess that I can be impatient when the point of their question isn't brought up immediately. I am sure the students sense this body language in a face-to-face meeting—but with IM they cannot sense my hidden impatience. Using instant messaging brings me to their stage where, despite the age difference, we are both the same—someone who is online conversing. I am treated as a peer.

I was very pleased to have connected with this class in this manner. I continued IM for a summer course, but I didn't connect as well as I did in the spring semester. I suspect that my hours (Sunday night again) just didn't meet the students' needs when they were online. Also they were two years younger (sophomores) and I represented their first experience with an "old" professor—I'd wager they probably didn't believe that I knew how to use IM!

CONCLUSIONS

In conclusion, adding more hours of contact time via a non-traditional method such as IM has the potential to facilitate student-instructor interactions outside of the normal classroom context. It also may help reach those students whose schedules don't allow them to regularly attend face-to-face office hours, or those students who, for whatever reason, aren't comfortable with an in-person interaction.

Because the concept itself is relatively straightforward, and the required software is essentially free, even a faculty member with limited computing skills can take advantage of this type of forum with just a little practice. Online office hours may not be for everyone, however. Both of the classes that are discussed in this article were relatively small, ranging from 15 to 30 students. How a lone faculty member would fare with 60 students (in a large class) or 200 students (in an intro or seminar-style class) is unknown to the authors at this point. With that many students, even a fraction of them online and asking questions at once could be overwhelming. With the proper ground rules, scheduling, and some assistance from TAs, however, we believe that this method is extendable to larger class sizes.

Additionally, while there are limitations to the forum, such as the lack of robust mathematical notation mentioned above, as new technology becomes available, many of the limitations will disappear. For example, improved handwriting-recognition software will allow for expression of mathematical notation that can be exchanged between users, and advances in voice and video compression will allow for real-time virtual interactions that won't be limited to the typewritten word. As these technologies become more commonplace, we can expect them to be used in the learning environment. Right now, we're just at the beginning of this technological explosion. □