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EXISTING TOOLS AND EXPERIMENTS OF ECOLLABORATION WITH A VIRTUAL CLASSROOM

By

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ABSTRACT

EXISTING TOOLS AND EXPERIMENTS OF ECOLLABORATION WITH A VIRTUAL CLASSROOM

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An eCollaboration software tool was designed specifically for an online class at Michigan State University. Student's reactions to the software tool were studied through two surveys, a focus group, and periodic use of the tool with the professor of the class and myself.

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INTRODUCTION

Chapter 1

Web browsing and email are the original two "killer aps" driving worldwide spread of the Internet. Other collaboration-oriented online services exist, such as text and graphical 2D and 3D chat rooms to connect people with common interests in real time. Instant Messenging is the latest online collaboration service to achieve widespread adoption, connecting family, friends and co-workers. This ever-increasing set of collaboration applications enabled by the Internet has not been integrated with web browsing. Exploring the web is a solitary user experience, even if 100,000 other people are concurrently reading the same web page.

Is there any reason browsing should NOT be solitary? How important is visitor to visitor awareness and communication? In general, it would be mildly interesting to know how many other people are reading the same page I am, at the same time. I probably don't care to know much about the other 99,000 strangers using the same web page, or to chat with them. However, there ARE people whom I do care a lot about. Family, friends, co-workers, classmates, teachers, and celebrities are examples of people I might want to run into when surfing the net. I'd like to know when socially or professionally meaningful others happen to be looking at the same web site I am, like a chance meeting on the street – a chance to wave and say hi and chat about the site. The challenge becomes creating a system to keep track of which people I care about, to help keep us connected. Meaningful communication networks for each individual would need to be stored and monitored

Online learning is one special case where awareness of relevant others can clearly enhance the experience. In online classes, students in the class are likely to be using the course web site frequently and for several hours each week. If I am one of 30 students taking an online course, and 10 other students in my class are online right now and reading class pages, I won't know they're there. Yet it would help my learning and my sense of community in the class to have a small window showing a list of fellow students currently online and using the class materials, so I can ask questions and chat with them.

So far this discussion has focused on visitors to a web site's awareness and communication with other visitors. Companies and organizations offering web sites have even more reason to want to communicate with visitors to their site. People have a hard time finding information on a web site. A 1998 analysis of 15 large commercial web sites reported web users were able to find the information they were looking for only 46% of the time, even though the information was available on the web site. (Web Site Usability: A Designer's Guide (The Morgan Kaufmann Series in Interactive Technologies, by Jared Spool, Tara Scanlon, Carolyn Snyder, Terri DeAngelo, Morgan Kaufmann Publishers;, 1998) One solution is to build better web sites. But the best usability is not going to be 100% successful at connect people with the information they seek. Why not have an "information button" to open up a chat with a live person to point lost visitors to the information they seek? Online museums, gardens, tourism bureaus, NASA, National Cancer Institute, elected officials, news agencies -- sites dedicated to providing information to the public can add an online live curator to their web site, to enhance the material, take kids on tours of parts of the web site, answer and ask questions.

Personal presence for online shopping is even more "mission critical" to an eCommerce site than to an informational site. Another 1998 study by Zona Research found 62% of online shoppers polled have given up looking for a specific product online at least once in the last 2 months – and 45% of those had given up on online shopping completely, turning to catalogs and stores. (http://www.zdnet.com/intweek/quickpoll/981007/981007b.html) In-person retail stores provide on site sales people to answer questions, encourage purchases, and make suggestions. Most retail web sites don't. Not yet. Why not, when a visitor connects to an online store, greet them – have a sales person type "hey, welcome, are you looking for anything in particular? If you want me to help you find anything or answer questions, just let me know."

Web sites are created to serve different functions, almost all of which could use personal presence to good advantage. Technical support and customer service functions would benefit from a live presence. Public relations are a common reason for creating a web site that could be enhanced by personal presence. Why let a potential donor leave the site without a personal welcome and offer to show them around? Lots of companies have a section on their web site announcing job opportunities. Why not tie in to the personnel office?

Entertainment invests heavily in online presence. These sites could be combined with collaboration software to increase traffic and to increase consumer involvement with the characters, performers, and each other. Many chat rooms feature celebrity guest appearances. Yet most movie and sports web sites do not include live communication with stars or fans.

Collaboration tools integrated with web sites are increasingly available but as yet little used. This thesis will review the major commercial collaboration tools. A hypothetical eCollaboration tool for online learning will be envisioned, implemented by Comm Tech Lab programmer Brian Winn, tested with a virtual class, and refined through several iterations. Conclusions and suggestions for future online learning eCollaboration software will be offered.

Chapter 2

Review of Commercial eCollaboration Tools

Customer Support and Online Corporate Presence tools are already being marketed. For example, websites subscribing to the LivePerson service can pop up a small chat window for customer support at the click of a button. LivePerson uses JavaScript to open the JavaScript chat window. Thus, no plugins are required so most web visitors are capable of participating in the chat without having to make any special effort.

Instant Messenging has become a baseline for Collaboration applications. Instant Messaging services allow people to identify their important telerelating partners, whether for home, work, or school. Unlike chat rooms most often used to connect strangers, instant messaging services focus on connecting people who already know each other. Instant Messenging lets subscribers know when their telerelating partners are online and available. It lets them send and receive instant messages but also forwards messages later if the receiving party is offline when the message is sent.

Currently, instant messaging cannot communicate with competing systems. Therefore Instant Messenging to work, all telerelating partners need to use the same service whenever they are on the computer. This requires downloading the application and running it. Individuals also need to identify each other and grant each other permission to join each other's "buddy lists" of telerelating partners.

At a minimum, Messenging Services allow for real time and asynchronous exchange of text messages among self-declared friends, family, classmates, and coworkers. Instant Messenging is more immediate, personal, and intrusive then email. People use Instant Messenging to conduct intimate relationships via this communication medium. People on the approved buddy lists have instant access to each other almost all the time including in the middle of phone conversations, meetings, and all other forms of work involving the computer. The more time an individual spends online, the greater their Instant Messenging accessibility. The services anticipate family, friends, and co-workers to all be on the system communicating with each other. These services also allow the individuals to communicate their online availability to the members of their list. So when you are online but are stepping away for some period, instead of going offline or being online without giving any notice to those that are trying to communicate with you, you can choose from the following status explanations: Busy, Be Right Back, Away for the Computer, On the Phone, Out to Lunch, or you can write your own excuse. The status message is sent automatically to the people when they try to send a message to an online but away buddy.

Instant Messenging could be used to connect individuals beyond their self-declared Personal Networks. For example, Instant Messenging functions could be useful in many online learning situations. The professor of a virtual course and all of the students could appear as a group on every student's Instant Messenging service. That way people know when their other classmates are online and willing to discuss class related work. Depending on the service, they can chat and exchange files of course material.

Technical support is another potential application realm for Instant Messenging. Technical Support might offer new customers a limited period of Instant Messenging instant tech support. An added benefit to the company is it's a two way street. IM could be used to send upgrade offers and new product information, in addition to responding to questions. Users could ask questions about the software or even chat about the latest computer offering or sale. Social parties or business conferences may want to offer attendees preset lists as an IM group. Almost any list serve might consider making itself available as a group on everyone's Instant Messenging service. Museums and information sites may want to place a button on their web site so people could add the museum curator to their personal Instant Messenging service to be able to ask questions about Egyptology. Teachers with the click of a button on a web site could even add NASA Scientists to the K-12 classroom messenging so students could get instant updates about Mars.

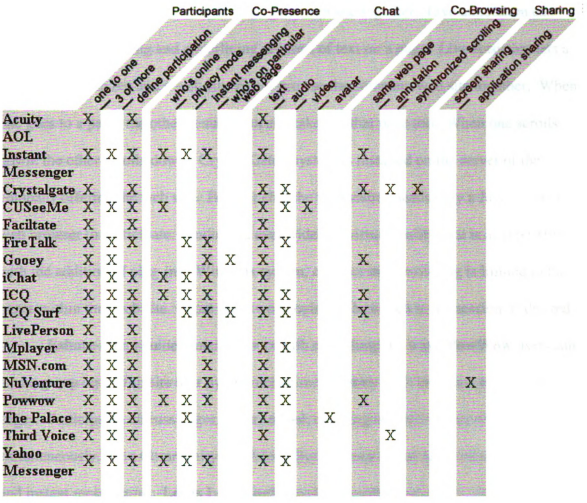
As the number of people on instant messenging lists grows, the importance of being able to manage their access to you also grows. I currently have 26 people on my ICQ buddy list. On the average, only 5 or 6 people are online while I am. It doesn't work for large numbers of people to be allowed to interrupt anytime for any reason. Large numbers isn't really the number of people you have on your lists, it's the number of people on your list who are online often and who you message with. I have friends with over two hundred people on their list. The size of your lists depends on how much time and how important these people are for you to be connected with. Instead there should be varying levels of access granted to different groups of people. If I am taking an online class, I would want my classmates to know when I am online and browsing course

materials. I would not want them to know when I am online doing things other than class work. Or perhaps you're instant messenging to family members and a few close friends but do not wish to discuss work or school at that time. It is possible to be invisible to these certain members of your list. You have control over who on your list sees that your online, and who sees you as offline, or rather invisible to them.

In this analysis of eCollaboration services, I looked at four dimensions: Co-Presence, Chat, Co-Browsing, and Sharing. I also considered how many participants -- whether it is one-to-one eCollaboration, 3 or more, and whether users can define the participants. Features of Co-Presence may include: knowing who's online, protecting privacy, instant messenging, and knowing who is looking at a particular web page. Chats may be text only, audio, video, or avatars. Co-Browsing refers to visiting the same web page together (synchronized browsing), in some cases being able to annotate the web page and share annotation, and being able to synchronize scrolling to see exactly the same parts of a page together. Sharing can include seeing each other's screens, controlling each other's computer, and exchanging files.

Eighteen eCollaboration services were identified through online searches and following up on cross-references. They will be analyzed along the dimensions just described. Figure 1 shows a breakdown of these services along each dimension. FIGURE 1 includes descriptions of the services and their URL's.

FIGURE 1



eCollaboration Services

CrystalGate Live Assistant lets the customer support rep and the person browsing the web site chat while browsing the web site together. Live annotation can also occur, highlighting and underlining sections of text on a page. Live Assistant lets a customer service rep and a web site visitor browse the company web site together. When one goes to a page, the other is automatically taken to that page too. When one scrolls down, the other scrolls down. Crystal Gate's system is installed on the server of the company offering the web site. For text chat the web visitor needs only a Java capable web browser to participate. Audio and even video or virtual reality chat is also possible with the addition of plug-ins. With this system, collaborative browsing is limited to the pages within that web site. More than two people can be added to the session, if desired.

Eshare offers guided internet tours with chat along the way. **PowWow** users can lead a group on a Web site tour by remotely directing their Web browsers to selected pages. Participants discuss pages as they travel, enabling multiple levels of interaction simultaneously. Koz Community Publishing System uses **iChat** for browsing together and instant messenging. **Lotus LearningSpace** has simultaneous Web "follow-me" capabilities to deliver class content. I don't know enough about these technologies yet to know whether they can operate on any web site, or if they work only for content run on a particular web server. It would be useful for a grade school teacher to be able to prepare a web tour on a particular topic, going to carefully chosen pages and guiding and chatting with the class as they take the web tour.

Third Voice offers an interesting twist on collaborative browsing. Participants need to download and install a helper application which enables them to annotate any web site. They mark where within the content their annotation should appear and who

should be able to view the annotation (anyone, self only, or a pre-specified group). When other Third Voice users go to that web page, they will see an annotation marker icon where it had been placed on the page. Clicking on the icon opens up the comment. This tool can be used as graffiti, to express political opinions, or, for learning purposes, to mark up a web site with annotations explaining or discussing particular content components.

The key for Third Voice and for other collaborative browsing tools is having the right base of users for the desired purpose, so that meaningful communication occurs. An entire class or other peer group would need to download and use Third Voice. To be useful, services like Third Voice would need to sell specific groups, such as a distance learning class, or a political or neighborhood or consumer group (consumer reports third voice). Alternatively, Third Voice could sell access to annotations by respected experts (surgeon general's comments on health care web pages). Everyone is not interested in everyone's opinions -- there would be more annotations than content on the web unless there were sensible filtering of whose annotations people see.

Work group collaborative software also allows collaborative browsing, among other things. **Lotus Notes** and **Microsoft Netmeeting** let you screen share with one or more other people. **Timbuktu** and **PC Anywhere** also screen share. The remote user can either observe and/or control the local PC. With some collaboration software two or more people can share an application, each adding to and editing content in the same open application. **Netmeeting, CUSeeMe** and other tools also allow for video and/or voice chat. Live streaming video is also possible.

Some of these collaboration tools allow one to one communication (point to point). Others are multipoint conferencing tools. Some are just text, while others include 2D or 3D avatars. Some allow voice. Some allow video. Most are synchronous and immediate. Some also have asynchronous features to allow messaging across time. Some allow a session to be recorded by the server and played back later. And if PC screens sound too small for all of this collaboration and browsing functionality, network a pair of HP VISUALIZE Centers with 8 foot by 20 foot Panoram Immersive Powerwalls so that large amounts of content can all be viewed at once at two locations.

Instant messaging was discussed in general earlier - here the three primary services are compared by their features offered. Currently, Microsoft, Yahoo and America Online are battling over Instant Messenging interoperability. AOL recently purchased **ICQ** for distribution along with their own **AOL IM**. Microsoft's new IM service asks users to provide their AOL password, allowing Microsoft to log on to AOL services and utilize the pre-declared buddy lists. It's useful to users to have interoperability -- ultimately this should be a goal for most collaborative software. But the Microsoft method in this case of requesting and storing user's passwords caused objections by AOL and privacy concerns by consumers.

The majority of these Instant Messenging software programs are free for download and free for use. Only a few of these software programs like AOL's IM runs banner ads on their software. Some companies ask users to fill out a questionnaire before downloading their product to ask them about their special interests for marketing strategies. And other services like ICQ sell access to companies to spam messages to thousands of online users with a direct link to their website. For example, a stranger will

be added to your buddy list without your permission and will message you stating you should visit this specific URL about gambling.

AOL Instant Messenger, ICQ, and **MSN Messenger Service** let me define "buddies, family and coworkers" (aol) "family, friends, and co-workers" (icq) and "contacts" (msn). ICQ and AOL let you define groups. In all three services you can see which of your declared community members are online. ICQ allows you to have ICQ on but define whether you appear as being online or not available. This setting changes the icon of the individual on their partners' ICQ window. AOL has an 'I'm away message'. Buddies appear to be online if their AOL messenger is open -- but if they have set the away message, then when someone tries to IM them the sender receives the 'I'm away message'. MSN only indicates whether a contact is online or not online, the state does not appear to be controllable by the user.

MSN Messenger Service requires a hotmail email account through Microsoft. When contacts are not online, the only option is to send them hotmail. It IS possible to use the features of hotmail, such as stationary. For many users, hotmail may not be their default email address. For them, MSN Messenger Service adds another layer of communication complexity because it's one more email box they need to maintain and check.

ICQ allows messages to be sent even if the users are offline. The messages can be sent via the ICQ server as an ICQ message or via email (the participants' declared default email). ICQ also allows for file transfers, sending a URL, live chat, greeting cards and voice communication. To take full advantage of ICQ, users also create an ICQ home page.

The eCollaboration tools are readily available but rarely useed in websites today. They are horribly incompatible with each other, have steep learning curves, might disappear tomorrow, and, to be interesting and useful, it's necessary that other key people you communicate with also adopt the same collaborative browsing tool at the same time.

Chapter 3

Goals & Planning of InClass

This section describes our initial vision for eCollaborative software to enhance distance learning. The initial concept of InClass was to create a live chat tool designed for Professor Heeter's online TC 891 course. Professor Heeter's online TC 891 course is a technology class about interaction and typography, taught wholly online as a virtual course. Since Professor Heeter lives in San Francisco, CA while the Michigan State University resides in East Lansing, MI and there is no classroom setting for this course, Professor Heeter wanted to explore new ways to connect the students in her class with each other, exploring the since of isolation that might otherwise occur in a virtual course. InClass was designed to provide a casual online co-presence to allow students to engage discussion with each other whenever appropriate and motivated. Since classwork almost always involves being connected to the Internet, the students will be encouraged to use InClass whenever they are online doing class work.

After an extensive categorization of the current online software that is currently available, Professor Heeter and I came up with an initial list of possible specifications that we wanted to investigate further and possibly implement into InClass.

One of the first specifications was to create InClass as a floating window. I thought that it was important to have a window on the computer desktop to remain on top of all of the other windows rather then becoming hidden behind other applications. This would allow students to work on other programs, but would be easily notified when another student was contacting them.

Greeting BOT

More of the functions that InClass may provide that we are researching is a Greeting BOT. A Bot is an avatar that will welcome every student to InClass each time they log in, using a short greeting Carrie can customize each day with current class announcement or fun facts for the day. Students may also be able to click on the Bot to message Carrie even when she's not online or logged in.

No Time-Out

An important feature that we found that similar software products did that we did not want InClass to do was have a Time-Out function. Many chat systems automatically eject users if they have been inactive for a certain amount of time. Students are encouraged 'hang-out' in InClass for long periods of time. Thus kicking them off the server will not be a feature.

Group Students

Professor Heeter's class may have thirty or more students. So it may be necessary to be able to assign students into sub-groups. This is more complicated, but having thirty students in a chat may be way too many. Professor Heeter will probably make the groups be consistent throughout the semester, based on primary interest area.

Links to Profiles

One of the special functions InClass may provide is personal links from the InClass software to certain personal profile pages stored elsewhere on the server. Each

student will have a Profile page within the class website. It would be useful to have a way to link to that profile page by clicking on some part of a person's avatar. A small icon on the person's avatar in the graphical mode might open the Bio when clicked or perhaps when you select the student's avatar and click on the button off to the side, then the page opens.

Direct Email

InClass will also provide a way for students to email each other. This may also be a same process to activating the Person Profile, but a keystroke or mouse click that opens an e-mail message addressed to the selected student or multiple students. The Profile leads to a clickable button for email but might be nice to be able to directly email the person as well.

Co-Browsing

Co-browsing is a feature that redirect everyone's browser to a particular web page. This is an nice feature when students are surfing the web and would like to share their experience with others that are online. Browser synchronization should only occur when students are in the Full Display Mode. Even then, they should have an option to lock their browser so they are not transported away from a page if they don't want to be.

Changeable Avatars

In dealing with the student's avatars, they should be able to change avatars during a collaboration session without logging out. We would like the software to support at

least three different avatars. These different avatars are personal icons that can be used to represent different emotions or moods. They can select which avatar to be from moment to moment, and they should be able to upload new graphics for any or all of the three avatar slots whenever they want to.

Avatar Rewards

A unique feature InClass may support is what we call Avatar Rewards. Professor Heeter will have control over the appearance of a small graphical area above each student's avatar, so she can briefly publicly reward a student with a "gold star" for a brilliant remark, a "halo" for being helpful to another student, or a "dunce cap" for being goofy or obnoxious. Or perhaps she may take control of the person's avatar for a moment.

Transcripts

A record of the transcript of the chat should be stored for the entire day, so students can read back through chats they may have missed. When a student logs in, they can acquire the full day's transcript rather than have the transcript begin when they log in. Entering into InClass in the middle of a conversation would be very difficult to get in on on the conversation without reading what others have said. We will probably be using a 24 hour period for recording the transcript from the beginning of 6am to the next 6am, because midnight is not really the end of a hacker's day. For confidentiality reasons, we will need to omit person-to-person whispers and only store public conversations.

File Transfer

To be able to transfer files from one student to another while in InClass is another feature we would like to provide. This will help students in transferring graphics or file documents between one another without having to email or FTP the document. Having a drag and drop feature to transfer the files would be ideal rather then to have a search window open up

Audio

We would also like to explore the ability to send audio segments between one another. So it may make typing messages less of an issue, if students could talk back and forth in a walkie-talkie style of talking using a microphone and speakers.

Three Modes

Because we wanted the window of InClass to be a floating window on the desktop, we had to carefully consider the amount of screen real estate that InClass took up. So we tried to understand the modes of interaction that the students would be using InClass for. We felt that it would be good to have three alternate display modes for the InClass that would take different sizes depending on the purpose. Since one of the goals for students is to be logged in whenever they are doing class work, they are more likely to comply if there are options so that their desktop is unobtrusive by InClass when not fully engaged in chatting. We felt that the user should be able to select among the three display modes, and be able to change modes during a session without having to log out

and log back in. The three modes of interaction that we came up with are 'Minimal', 'Partial', and 'Full' display.

In Minimal mode, InClass would appear as a very small rectangle on the desktop. This window would contain two icons to alert the user of messages. One icon would flash each time anyone sends a message to the entire group of online participates. The other icon would flash and make a sound when someone is specifically trying to contact you. A whisper function would allow students to send messages to a selected specific individual or set of individuals. A broadcast function, the default mode, would send a message to the entire online group. On other student's graphical chat windows, a person in the Minimal mode would be shown as being present in the conversation, but their avatar will also show that this student is in Minimal mode perhaps using a graphics such as a cartoon character that is sleeping. The main function of the Minimal Mode is so that students can work on their computer without the chat forum taking up screen space, but be present to the class when someone wishes to chat.

In Partial mode, InClass would be avatar-less and would contain a standard chat area with basic chat functions. This mode would only use a small text-only chat displays and the users name. Browser synchronization would not be available. And there would not be any whisper send functions in Partial mode, just full group messaging. You can receive a whisper, but you can't whisper back without moving to a mode where there are icons to select to direct a whisper. The size of the partial display would be about two inches wide and 4-5 inches in length.

The Full mode would contain a full size chat window that will take up an entire screen that was set at 480x600. This mode will also contain all of the student's avatars and all of the options that are available to InClass will be accessible.

Chapter 4

Design Progression

Version 1.1

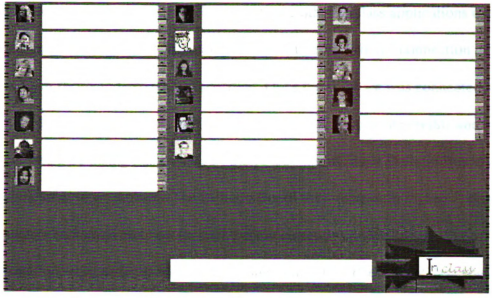
InClass progressed through both aesthical design qualities and coded functionality over a period of six months. The majority of the changes were add-ons to the core functionality that the students had requested to help better serve their needs. Despite the continuous changed to the software throughout this time, since the application had to be downloaded by all users for each upgrade, we limited releases of new versions of the software to three launches.

InClass's core code was created using Macromedia's Director 7 software. Brian Winn, lead programmer, web master, and assistant director for the Communications Technology Laboratory (CTL) at Michigan State University, coded all of the functionality to InClass. InClass was then hosted on a CTL server with access privileges for all enrolled students in Professors Heeter's class.

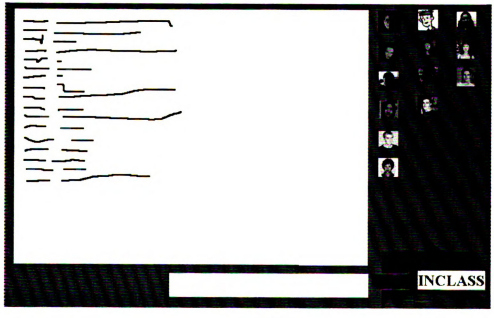
InClass's first launch had the core functionality that Professor Heeter, Brian Winn and I thought would be most appropriate for the class and do-able with very limited programming time since the project was un-funded. However, the design of the interface was still primitive. A screen shot of this first launch can be found in Figure 2. Initially, to log into InClass, the student would see a layout of their class list's avatars. They would be given the option of locating and clicking on their avatar which would then represent them as they entered the InClass collaborative workspace. Through further

speculation, this design was dropped and a simpler login and password feature was added. Issues were raised to making the students spending a few moments searching for their avatar out of a list of 30, even more important for larger classes. Another issue was giving students access only to their avatar to prevent impersonation of other students within the collaborative workspace. For this first version, the login was the name they chose for their avatar (ie. m@, carrie), and the passwords for the students was all the same generic word (typo). So, everyone knew everyone else's password.

FIGURE 2



Ver. 1.1 - Bulletin board View



Ver. 1.1 - Conversation View

Once the student entered their login ID and password, the downloaded application would connect through the CTL server to the other InClass applications currently open. It sometimes took a few minutes for InClass to establish this connection depending on modem speed and network congestion. Once the software was connected, the screen would display the "Greeting Bot" message including software credits and copyright statement. Closing this pop-up would reveal the InClass's Bulletin Board style collaborative workplace. The Bulletin Board view (shown in Figure 1) displayed the avatars and small text box for each person currently connected to InClass. The Bulletin Board view is, as far as we know, unique to InClass. Because InClass was intended to be used as a casual co-presence, the Bulletin Board view provides an easy way to assess the current state of each participant – to read the last thing they said, and to see their current avatar. Thus, when someone is away from their computer, they might change their avatar to "Away" and type "Gone to the kitchen to deforst chicken. Back soon." Or, if they are stuck on a project and need help, they might type "HELP HELP HELP!!! Flash Question!!!" Professor Heeter or the TA's logged in, could see right away who to respond to.

Professor Heeter and I created three additional avatars for the students which they could swap in place of their photo avatar while communicating with others. The size of the avatars though out the production of InClass was 32 x 32 pixels. Avatars was intended to help express the student's mood for the day or creatively express a response to someone else. To swap avatars, students could click on their own avatar and a small pop-up window would appear showing the additional avatars. The three generic avatars we created were an 'Away' avatar, a 'Light Bulb' avatar and a 'Paper Bag over the Head'

avatar. This way, when students were away from their computers for any short length of time, they could change their avatar to the Away avatar and easily notify everyone that they were not currently available to chat. The Light Bulb avatar was for when someone had a bright idea to share with others or when a concept became clear to them. And the Paper Bag over the Head was created more for comic relief for the students. Students could switch back to their normal photo avatar by clicking their current avatar to open the choice window, then selecting their photo again.

When students would type in the text box at the bottom of the InClass window, the text would appear in the text box next to their avatar in the Bulletin Board view. This action was alerted to other students by highlighting the textbox of the last person to type in a message and playing a sound when a new message was sent. As students interact with each other, the highlighted text boxes would follow the conversation from student to student.

This view Bulletin Board was well suited for periods of limited interaction. But once there were more then four or five students engaged in conversation, the highlighted text boxed became too difficult to follow. So by selecting the menu bar at the top of the window and looking under "Views", students could select upon "Conversation" mode and find a different style of text layout. Conversation mode consisted of only one large text box that extended across the majority of the window. As in most chat rooms, all messages get added in the order they get entered to the main chat window. The result is a scrolling text document with the oldest comments at the top and the most recent at the bottom. It grows as the conversation progresses. This view was found to be much easier

for following conversations when many students were chatting with each other or when large amounts of text was being written per line.

Some features in InClass were available regardless to what view the student chose to view the conversation in. One of these features was whisper mode. Typically when a student would type a message and then hit return, every student currently logged in would receive the message. The whisper feature allows students to send their message specifically one or more students currently logged into InClass rather than to everyone. In order to engage the whisper mode, the student whispering to the others would simple select the other student's avatars from the InClass window. When the student would select another student's avatar, that avatar would be outlined in red and the other student's avatars would become dimmed out. Then the student could type their comments in the white text box at the bottom of their screen as usual. To turn off the whisper function, students click on each of the selected avatars again, to deselect them. Once all the selected avatars have been deselected, open messaging would be reinstated. In this first release of InClass, the whisper mode did not work as perfectly as we had planned. Students would try to whisper to other students, but the wrong person would receive the whisper. The bug was determined to relate to spatial location of avatars – if one person logged out, the spatial information was re-sequenced and the whisper was misdirected. Basically, the bug made whisper unusable.

Another feature to InClass is the option to email any student engaged in InClass. When students wanted to send large documentation and InClass's smaller text boxes were not accommodating, email was a simple way to transfer this information. Clicking on the name (below the avatar) opened a blank email message pre-addressed to that person

When students wanted to share a web site with others, they could simply type in the URL including 'http://'. When the students would type in the URL, the text in the Conversation mode would be hotlinked so everyone could click on the URL causing it to open in their default browser.

This first launch was in the fourth week of January 2000 (the second week of the semester) and this version was available for 8 weeks.

Version 1.2

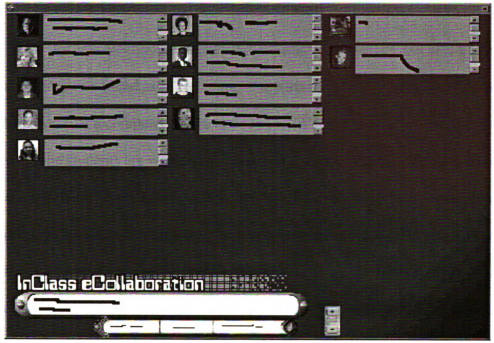
After InClass Version 1.0 was out for 8 weeks, we gathered students input through a focus group and used their feedback to make some advancements to InClass. The most obvious change to InClass was its appearance. Graphical elements to InClass including color scheme and logo were redesigned to have a more pleasing look and feel to the software. This launch of InClass was Version 1.2 and can be found in Figure 3.

Another new feature added to InClass 1.2 was a database for assigning multiple optional avatars to individuals. The database could only be changed by system operators (Brian Winn, Professor Heeter, or myself) but now these avatars could be changed without sending out a new version of InClass.

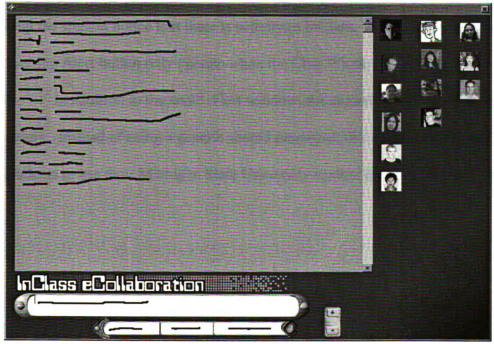
Many students found it difficult when they logged onto InClass in the middle of a conversation because they had no idea what was previously said. So Version 1.2 recorded everything that the students had typed, except anything that the students had whispered, and was available to the students in the Conversation view. To facilitate communication, recent history of what has been said in InClass appears in the

conversation view when students firth logon. This allows the students to catch up on what has been said recently.

FIGURE 3



Ver. 1.2 - Bulletin Board View



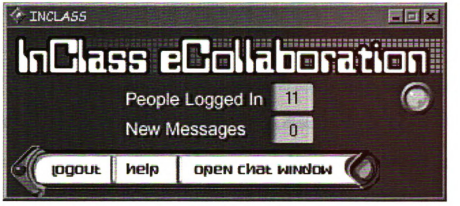
Ver. 1.2 - Conversation View

Version 1.3

InClass Version 1.3 included more aesthetic changes, but also a feature change many students found as to be the most important. The size of InClass's screen real estate has been fills a computer screen at 640x480. Version 1.3 added minimum view so that when the students are working on class work, they could minimize the InClass window and still know when messages were being sent. Now upon startup of InClass, a small display shows the current state of InClass seen in Figure 4. This small window displays how many students are currently logged into InClass. It also displays a New Message counter, Alert button indicator, and Open Chat Window button. The Open Chat Window button would open the larger window of InClass from the previous version. But while the larger chat window was closed, the New Messages counter incremented every time someone sends a new message. When there is a new message, the Alert button flashes to help the student notice that there is activity in InClass. The Message indicator and flashing Alert button only operate when the Chat Window is closed.

In addition to the small Alert window, the student's login has become more secure. Instead of using a generic shared password, this version of InClass has the students to use their Michigan State University student ID's and password to login.

FIGURE 4



Ver. 1.3 - Opening Scene and Minimal View

Chapter 5

Methodology

Case study methodology was used to observe the students interaction with the In-Class software in order to develop a "thick description" of the virtual classroom. To test our software, 23 students at Michigan State University (including 7 graduate students, 9 undergrads, and 7 lifelong learning students) who were signed-up for Dr. Heeter's online TC 891 course used the software as part of their online learning experience.

All of the students that were accepted into Heeter's TC 891 class had to submit an application. Grad students or undergrads, TC majors or non-majors were all welcome to apply. There were a few prerequisites in order for the students to get into the class. Students must have done well in either TC 446 (director) or CAS 492 (web design) or otherwise have demonstrated prior knowledge/experience with multimedia authoring. Thus all students were qualified to study the class material and all were selected at the approval of the Dr. Heeter. Because the students in this class understand multimedia and web design, we hoped they would also be sensitive to fundamentals of the InClass software design process and offer more informed feedback then the typical non-computer savvy student.

The purpose of this study is to assess how students in Dr. Heeter's online TC 891 course use "InClass," a prototype live collaboration tool designed to enhance the distance learning experience. InClass provides a casual co-presence, intensifying into discussion whenever appropriate and motivated. Students log in to InClass whenever they are online doing classwork. The window stays open on the side while they browse class web pages

and work on assignments. Students can see who else in their class is online and post and exchange live messages with the whole group, specific other students, or the professor. Students will be encouraged to use InClass whenever they are online doing class work.

Our study uses four different methodologies: Participant Observation, Anonymous Online Surveys, Online Focus Groups, and Log Analysis. The students first completed an online survey anonymously, using the MSU Virtual University SIRS form system designed to ensure anonymity of responses. The individual identities from the online focus groups and the InClass software logs are held confidential from Dr. Heeter as well as the public. The anonymous CONTENT of those reactions WILL be shared with Dr. Heeter immediately, to help revise and use the InClass software to optimize the student experience. The email to the students including the confidentially assurance can be found in Appendix A.

First, both Dr. Heeter and I made personal observations of how the students interacted with each other using InClass during the semester. We were participants (me as a student, Heeter as professor) in the collaboration process on a day to day basis. We thus have our own personal reactions to using InClass and we have noted patterns of student reactions and use. More specific observations focus on the nature of student's discussions and Dr. Heeter's 'teaching ability' using the software in regards to whether or not this software makes virtual education any easier or better.

Second, there were two Anonymous Online Surveys, one at the beginning before InClass was introduced and once at the end of the semester. Students were invited though e-mail (Appendix B) to complete an anonymous online survey. This survey gave the students a chance to rate specific aspects of the InClass software. The first

questionnaire given the second week of school asked about what computer that the student will be working on for class work and about their past experience with other collaboration software. The first survey can be found in Appendix C. This second survey asked them to rate specific aspects of the software along a scale from "NOT IMPORTANT AT ALL TO ME" to degrees of "VERY IMPORTANT TO ME." Also, they rated how the InClass software performs particular tasks by "IN CLASS DOES POORLY" to degrees of "IN CLASS DOES WELL." The second survey was collected near the end of the semester. The email invitations can be found in Appendix D and the actual survey can be found in Appendix E.

I had intended to conduct an online focus group to talk with students at length about their reactions to InClass. However, Heeter visited East Lansing in week 8 of the semester, and the class gathered at Patrick Dickenson's house for a face-to-face meeting. At that session, InClass was discussed in detail. We determined that an additional online focus group would be redundant – that the students had said what they had to say.

The main questions discussed at the Dickenson gathering related to InClass are:

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1) What about InClass do you like and why?
2) What about InClass do you dislike and why? How would you change it?
3) What would you like added or changed with InClass?
4) Would you like to use InClass in other Virtual/Regular classes? Why/Why not?

5) What would need to be changed it this software was to be in a non-telecommunication class with technological savvy students?

Last, I conducted an analysis of the Logs. The following list contains the specifications that we hoped could be analysed from the logs, depending on what is technically possible:

Average time a week each student had InClass open.

Minimum time each week each student had InClass open.

Maximum time each week each student had InClass open.

Total number of messages sent.

Total number of messages received.

Total number of messages sent directly to Dr. Heeter.

Total number of messages sent to only one other individual.

Total number of messages sent to two to 5 other individuals.

Total number of messages sent to the whole class.

Total number of messages containing URLs.

The following timeline is to help display the data collection events:

Week 1: (General orientation, no InClass activity)

Email students consent form to record their logs.

Observation starts from DAY ONE and continues thoughout the entire semester.

Week 2: First Survey form and release of InClass 1.0

Week 7: Release of InClass 1.2

Week 8: Focus Group at Dickenson's house

Week 11: Release of InClass 1.3

Week 13: Final Survey

Week 15: Log Analysis

InClass Initial Survey Results

The students in Professor Heeter's Virtual Course were asked to fill out an initial online survey about their past experiences with collaborative software and what functions they would like to see while using InClass. This survey was completed by only four students. It was administered before the students saw any rough plans of InClass.

This is the first virtual class that all of these students in Professor Heeter's class have taken. One of the initial issues we wanted to know about the students was just how helpful they felt InClass would be in certain situations. Out of a five-point scale with (1) being NOT AT ALL HELPFUL and (5) being VERY HELPFUL, students expressed that they felt InClass would be of an average of (3.75) helpful in connecting them to other student while studying the class material. When asked how helpful InClass would be to connect the students to the professor while learning the class material, the average was much higher at (4.5) on the same rating scale. All of the students choose (3) when asked how helpful they thought InClass would be for sharing excitement about new designs.

More of the student felt that getting feedback on their work in progress would be more helpful with an average response of (3.75).

Over 75% of the students in Professor Heeter's class stated that they use some type of instant messenger (ICQ, AOL Instant Messenger, MSN messenger service, etc) in their weekly schedule. Only 25% of the students have never used an instant messenger service at all. However, all of the students have used chat software before. Almost 25% of them use chat on a daily basis. Another 25% of the students state that they use chat weekly, while half of the students only use chat software occasionally.

Most of these students spend at least 8 hours a day during the week in front of their computer. Their time in front of the computer is usually divided up between the workplace and at home. A wider range of hours on their computer is found during the weekends. Some spend as little as an hour or two in front of the computer on the weekend while others log a full workday of 8 or more hours.

The students are being encouraged to log into InClass and stay logged in whenever they are online and doing TC891 class work. So the students were asked that without having used InClass yet, what was their expectation of the time they spent actually logged into InClass while they were doing work. The majority of the responses from the students stated that they planned on being logged into InClass 60% to 80% of the time that they spend working. One of the students made that statement that they preferred not to be disturbed or distracted while working on a project or studying. So they would log into InClass when they were done with their work and felt they would still spend 40%-50% of their class time logged in.

Focus Group Discussion

During the 8th week of the semester, Professor Heeter made a trip to visit in person the virtual class. She and all the students met at another professor's house to discuss the class material, plan for the second half of the semester, and discuss InClass.

The majority of the class seemed to agree that they liked InClass, but that they really didn't have much time while they were online to use InClass. These students usually did not use InClass much during of the first half of the semester. The few students who did log in made the statements that when they logged in, no one else was present. So a communication gap existed because although these students had a medium to meet, they were on it at different times and not connecting. Usually they would see no one else was online, and then log off immediately. That made the window of opportunity to encounter each other online very small.

After observing InClass being used infrequently, Heeter decided to begin scheduling LiveChat sessions using InCLass, to bring students in contact with industry professionals. The topics of InClass that almost everyone agreed upon what that they enjoyed having guest speakers visit InClass. A guest speaker would join InClass at a specified time, usually this was 8pm on Wednesday night. Usually 5-8 students also showed up. The students really liked the fact that they could all write questions to the speaker at any time during the session and the speaker would eventually get to answer the student's questions. Even those who never attended a live chat said they liked being able to read the transcripts later.

Those students who did use InClass had a few suggestions to help improve the software, including the concept of a Minimize mode. They asked to change LiveChat time to Sunday nights at 8pm.

By the end of the meeting with Professor Heeter, most students made the statement that they would try useing InClass more often.

Final Survey

Students were invited to fill out an online survey about their experiences with InClass software and what functions they liked and disliked while using InClass. This survey was completed anonymously by 15 of the 20 students.

Due to the lack of participation in the first survey, I used a new strategy in order to get the students to fill out this final survey. First, I emailed a generic email to the class following UCRIS protocols for human subjects approval, found in Appendix F. I sent a subsequent email staying true to UCRIS but with the subject of the email written as: TC891: SEX SEX SEX. I needed the students to open the email and at least glance over what I needed them to do. Then later that day I sent out another email to each student that was individually addressed. This email told them that even though the survey was anonymous, I was counting on them personally to help with my thesis by filling out the survey. Of the 16 students I had emailed, 15 of the students filled out the survey.

All of the students in Professor Heeter's class download the first two versions of InClass. Only about 13% of the students did not download the third version but the other 86% downloaded the most recent version of InClass. Of these students, they all logged

into InClass at least 3 to 5 times and more than 60% of the students logged in more then 6 times.

The students who did not log into InClass often had mixed reasons why. One student made the comment that they did not log into InClass because when they did work on class work, it was in the middle of the night and no one else was ever online. So, after the first few weeks of logging on to InClass, this student quit trying to see if anyone else on online when they were. Another student did not have the time to log into InClass because of he was too busy and had such a short amount of actual working time on the class work that he didn't feel he had time to be logged into InClass.

One of the special features that separated InClass from almost every other collaboration software was its use of avatars. Over 80% of the students said that they did like that feature and the other 20% said they felt neutral about it or they didn't care one way or the other. No one taking this survey stated that they did not like the avatar feature. Many students wanted more variety of avatars to choose from. A large majority express how underutilized this feature was. More then one student expressed that the avatars should have represented more emotions. These students felt that the avatar feature would work at its best when the avatars could express "confusion", "enthusiasm", or "disappointment" for the instructor and other students to see without the user having to type his thoughts out for further comments from the speaker. Another student made the comment that although they knew they could create their own avatars for InClass, they would rather have a way that they could post their own avatar to InClass rather then sending it off to the InClass developer. This person also felt that there should be a pool

of avatars that the students could choose from that represented each individual's personal identity and uniqueness.

Currently, when a user logs onto InClass, their avatars position is always the upper left-hand side of the rest of the avatars. As other students log in, the additional avatars appear around the user's avatar. So, every users screen tiles the avatars differently. One of the students felt that it would be more helpful if Professor Heeter's avatar was always the top and left-most avatar and that the guest speaker for that session was to the right of Professor Heeter. They then wanted the remaining avatars of the students to be tiled down in alphabetic order. They felt that this would create more order within InClass and easier for them to know by location who was and was not present. One student suggested highlighting the speaker's avatar and text so that their comments would be separated from the students. Also by separating the speaker, the student feels it would be giving speaker a type of VIP treatment.

One of the students has made the comment that when Professor Heeter or any of the other students changed their avatars that they wanted to change theirs also. But that they also felt rude for they did not want the speaker to feel offended by their actions of changing the avatar frequently. They also did not want to give the speaker the impression that they were too busy to read what the speaker was typing and not giving their undivided attention.

Of the avatars that InClass provided to the students, students had made comments on each of them. One student commented that the "Away" avatar was very helpful for knowing that that student was not ignoring them by not responding to their writings in InClass. Another student liked the "Light bulb" avatar. They felt if there were more

avatars like the "Light bulb" that gave such meanings as "I have an Idea", that they would use the avatars more often. Another student liked the "bag-head" avatar that was a kind of silly-humor to show off to the speakers. And only one student made the comment that the avatars that InClass provide were enough and no more needed to be created.

Throughout the semester there were nine guest speakers from the industry who students and Heeter interviewed about their work and class topics. When guest speakers visited InClass, Professor Heeter would post the transcript of the conversations online for those not present to read at a later time. About 80% of the students attended some or all of these meetings. The other 20% of the class said that they never made it to any of the online meetings but spent time reading the transcripts afterwards.

Many of the students had plenty of suggestions for future live InClass speakers. Professor Heeter wanted to know if having audio clips of the speakers voice available for download before the InClass lecture would help students know the speaker better. A few of the students commented that they liked this idea. One student wanted to take that idea a step further by making available a short digital movie (.mov or .avi) of the guest speaker so that the students could not only "hear" the speaker, but also "see" the speaker. Only one student made the comment that audio clips were not necessary.

One of the guest speakers had pre-written segments of information that he could cut and paste into InClass. This method helped keep the InClass session for students did not have to wait for the speaker to write a reply. Some students commented that they wish the other speakers had done this because sometimes the speakers were rather slow typing into InClass.

The last InClass session the class conducted, two speakers were present. Typically the speakers are bombarded with numerous questions from the students. A few students felt that the speaker's time would be made more useful in InClass if only one speaker was replying to the questions rather then two. They felt that the conversations were getting crossed though the session. And they stated that they were having a difficult time keeping track between the two conversations. But a number of other students enjoyed having two speakers rather then just one. These students felt that the numbers of questions that the students threw out to the speakers were just too much for the speaker. By having two speakers, the questions would be answered much quicker and there would be less waiting for a speakers answer. One student stated that the conversation could become confusing if the speakers strayed from the same theme but that the last session with the two speakers when well.

One student felt that InClass wasn't as productive as it could have been because "the latest downloadable version was obtrusive". They felt this way because InClass used up much of the screen real estate. They felt that InClass should follow the AOL Instant Messenger model of a panel. They also felt that InClass should let the user know when they were being addressed. They stated that in their opinion by doing this that doing this that would enhance the interactivity in this application.

A few students had suggestions of InClass when dealing with speakers. One suggestion was for a specific text box for questions to be entered so the speaker would be able to read the highlighted questions without it getting lost in the scrolling text conversation. Another suggestion was concerning the bulletin board mode; the student

wanted to have one question in it's own box and then the speaker could put their reply in the respective box.

A few students made a few more comments about the bulletin board mode. It was said that the Conversation mode was preferred over the Bulletin Board view. These students felt that it was too difficult to follow the conversations in this Bulletin Board mode. One suggestion for improvement of the Bulletin Board mode was to change the way it is used. They wanted it to be used more for announcements and weekly requirements. They felt it could be changed to be more like a set of personal softboards where people can learn for other people's comments and requirements. One student suggested removing the Bulletin Board mode altogether from InClass.

When the students were asked about having an information page with more details about the speaker's background, almost every student had comments about that being a good idea. A number of the ideas about this information page suggested that there should be one short information page that explains the basics about the speaker. This page would need to be linked off that InClass session for easy connection. Then after the brief bio, there could be additional information about the speaker's starting point from Michigan State University and their relationship to the material if the student had time to read. This additional information could also include past and present (non-confidential) work. Students felt that this would be the starting point for the InClass session and would help students construct appropriate questions to ask. And by posting this information before the InClass session one student felt that it would get the formalities out of the way and would allow the class more time to ask real questions of the speaker. Another student felt that if this material was posted in advance, then the

class could construct questions before the session and then copy and paste the questions into InClass to save time from writing the questions out.

One student would rather communicate with the speaker in a teleconference session. They felt this would enhance the student's sense of involvement and presence with the speaker. They suggested adding video and audio to InClass.

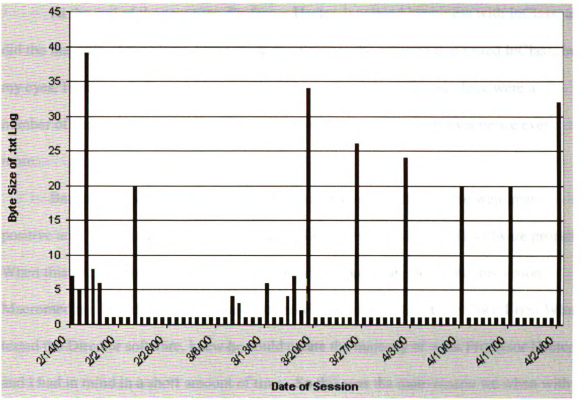
Another student felt that the text box to write comments in was too small. They had trouble typing long sentences. They also felt that the text field was difficult to edit what was already written because portions of the text were hidden from view.

All of these students spend much of their day in front of the computer. A quarter of the students spend at least 20-30 hours a week in front of the computer. A third of the students spend 40-60 hours a week in front of the computer. And the remaining 40% of the students spend more then 60 hours a week.

Log Analysis

The 69 days that the students had access to InClass was all recorded in a log. A bar graph displaying the days of the log and the size of the text files that were recorded from InClass in byte size can be located in Table 1. Of these 69 days, there were 8 InClass sessions that had a guest speaker. By looking at Table 1, these 8 days all have the largest log files. There were 10 other significant days were the logs were larger then 1k. The 51 days that are recorded as having only 1k means that there was almost no activity in InClass that day.

Table 1



Student's Log Analysis

Chapter 6

Conclusion

At the end of the semester, Professor Heeter expressed happiness with InClass, as did the majority of her class. Since these people were the subjects that tested InClass, in my eyes, I feel that InClass was a success. Although it was a success, there were a number of improvements that could be done to enhance the students experience ever more.

Because InClass was created using Macromedia's Director, there were many positive and negative aspects we encountered during the creation of this software project. When this project initiated, we had no idea how we were going to create this vision. Macromedia's Director 7 had just been released with new capabilities. Once Brian Winn tested the Director software, knew he could create the majority of what Professor Heeter and I had in mind in a short amount of time. So this was the main reason we when with creating it in Director was because it was the easiest and fastest way to create the functionality. Had InClass been a funded project rather than a gift from Brian Winn, we might have chosen a different coding language, and we would have spent more time debugging and polishing the software.

InClass used up a large percentage of the computers virtual memory. When the computers virtual memory was used up, the student could not use so many different applications at once. Rarely was this an issue for students because they could always have a browser open to surf the web. But in some cases, students were working on other software programs that also used much of the virtual memory. Such situations were that video was difficult, if not impossible, to watch on a computer that was running InClass.

But because of the software we used in the creation, no reasons could be found of why this occurred.

In my opinion, one of the biggest issues the class had with InClass was that they already used a collaboration tool like ICQ or AOL and did not want to add another application to their desktop. What would be an ideal tool is collaboration software that interconnects all currently available tools on the market. This way it would not matter if half the class had one collaboration tool and the other half had a different collaboration tool because they all could still communicate with each other. Or even creating a plug-in to one of the major collaboration tools that the students use so they could use a tool that uses InClass's functionality, but in conjunction with their current software.

From the original goals Professor Heeter and I set up for InClass, a few of these ideas did not work out. We initially wanted three different modes for InClass: Minimal, Partial, and Full display. We realized that three different modes were just too much. The software needed to be simpler for the students to use. This was why we created only the Minimal and Full display.

We had also stated that one of our goals of InClass was to have browser synchronization. We did create a way for hot links to appear in the text when students would start typing the URL with "http://". We chose not use create a browser synchronization function because we discovered the problems that could occur. When students were surfing on their own and had InClass open, when another student would click the "browser synchronization" button, then the student that was surfing on their own would be transported to a different site. This would not have been something that the students would have wanted so we decided not to use this functionality for this project.

A greeting bot was not used for InClass because Carrie did not have the time to generate interesting diverse greetings. The bot just was not one of the aspects that we though was necessary.

We also did not break up the students into groups. Once we saw the class list, we realized that there were not enough students to fill two InClass rooms on a daily basis of chance encounters. On the average, InClass would gather about 5-8 students online at a time. Even in the initial surveys, the students stated that prefers to all be together in InClass and not be grouped beginner and advanced.

Both Professor Heeter and I agreed that InClass worked great with 5-8 students and a guest speaker. There were plenty of opportunities for students to ask questions to the quest speaker. As the speaker would gather a number of questions from the students, they had the opportunity to choose which questions they wanted to answer first and answer the rest when they were ready.

This was a much better way to conduct a guest speaker session then by teleconference like the class did before. Usually, the students would meet on-campus and speak to the guest speaker on speakerphone. Other then the obvious problem that students actually had to be at the meeting physically, students didn't have the same voice to shout things out like they did in the InClass sessions.

A phone conversation with two speakers and the class would have been near impossible, but not with InClass. When two speakers joined the class, they both answered the same questions for the students. This gave the students a chance to see the similarities or differences between the two speakers. Also the time that the students spent waiting for the speaker to type their reply was shortened when two speakers were present.

Since the guest speaker aspect of InClass went so well over the semester, an improvement to InClass would have been to have a feature highlight the students questions with certain colors. This way it helps separate the questions from the content for the students and speaker to pick out quicker.

InClass's use of avatars definitely separated it from other collaboration tools, but it could have been utilized more. In the future, students will be encouraged to create more of their own avatars. None of the students create more then their initial one avatar.

Allowing InClass to be accessible twenty-four hours a day seven days a week may have been too broad for the students. Specifying more specific times for InClass may have helped students come together. One problem was that the number of students were so low, that the opportunity for students to chance meet with each other. Had the class been larger, over a hundred students, there would have been more opportunities for students to meet online in InClass.

APPENDIX A

WEEK 1 EMAIL AND ONLINE CONTENT

Subject of email: Research on InClass Chat Software in TC 891

Greetings,

Many aspects of the spring Virtual Design Studio class are experimental, and I need and want your feedback about all aspects of the class throughout the semester. One element of the class in particular is part of a formal research study being conducted by Matthew Leach for his MA thesis, with me as his MA advisor and co-researcher.

When formal research is conducted at Michigan State University, rules for research involving human subjects (that's you) must be followed. With that introduction, I turn the rest of this email over to Matt Leach to explain the project and to ask about your willingness to participate.

Carrie

OK, this part is from me, Matt Leach.

Carrie and I have been analyzing what we call "eCollaboration" tools for the web for the last 9 months. You can read the analysis so far and check out existing tools and research at our web site,
http://commtechlab.msu.edu/randd/collaboration/
A surprising number of eCollaboration tools exist already, but they are almost never used on web sites. It's a dimension of web experiences only beginning to be adopted. Online learning is one of the biggest applications likely to benefit from eCollaboration tools.

As you've probably already read in the syllabus, the Virtual Design Studio course is going to use InClass, eCollaboration software being developed by the Comm Tech Lab specifically for online learning. In fact, specifically for TC 891 right now.

There are four different ways I plan to study InClass in TC 891 this semester. One is called Participant Observation. That just means Carrie and I will be logged in to InClass with you, and we will be taking notes (and welcoming comments) about the experience as it happens. Carrie assures us and has stated in the syllabus that participation in InClass will not be related to your grades in any way. InClass is there to give you a sense of community with your classmates, to encourage group learning and cooperation, and to provide help right when you need it.

Two other research modes are anonymous online surveys and online focus groups. You will be invited to complete three online anonymous surveys – one at the beginning, one at the middle and one near the end of the class. You are under no obligation to fill out these surveys. If you do, your responses will be anonymous, not linked to your name in any way. Before each survey you will find wording like this email informing you of your rights as a human subject.

You will be invited to one or two online focus groups throughout the semester. Again, your participation is voluntary. Dr. Heeter will NOT attend the online focus groups. I will take notes and summarize the discussions, removing names and personal references before sharing them with her. Again, before the focus groups, you'll be given wording like you see here to make sure you are participating because you want to.

The final mode of research will be log analysis. That's my main reason for emailing you right now, other than to introduce the study. InClass does not store the contents of discussions but it does keep track of each time everyone logs in, and how long they are connected. Analysis of those logs become part of the description of how InClass was used.

But, as a human subject, it is up to you to voluntarily consent to having your log data included in this analysis. If you do not want your logs analyzed, then Brian will cause all of your logging in activity to be deleted before he gives me copies of the logs. I will remove names, replacing them with anonymous labels (such as Person 1, Person 2...) before sharing them with Carrie for quantitative analysis of InClass behavior by anonymous individuals.

If you are willing to have your InClass log anonymously included in the log data Carrie and I analyze, then you should send a simple email to Brian Winn (winnb@msu.edu) that says I agree to have my InClass log data included in the log data for analysis.

If you do not want to be part of the log analysis, you don't have to do anything. People who do not email Brian to say it's OK will be deleted. Brian will not share with Carrie who does and who does not agree to be included in the log analysis. She will receive the processed logs from me with names removed. Anyone who did not agree to be included won't be there. And anyone who did agree to be included will be there, but not by name.

So, if you are willing to have your logs analyzed, please send email to Brian this week. You can change your mind and email him back asking to exclude you any time during the semester.

If you have concerns at any time about your rights as a human subject in TC891, you can contact Dr. David Wright, chair of the University Committee on Research Involving Human Subjects (517) 355-2180.

Sorry about all the legalistic wording and procedures here. In the end it is to protect your rights.

You'll hear more from me during the semester!

-m@
Matthew J. Leach

APPENDIX B

INVITATION TO ONLINE SURVEY

Subject: Survey on InClass Collaboration Software in TC 891.

Hey classmates,

As you have read about in the previously e-mails and on the website, Carrie and I have been researching Collaborative software. I need and want your feedback about certain aspects of your involvement with existing Collaborative software. One of the elements that is a necessary part of the formal research study of this software is an Online Survey.

When formal research is conducted at Michigan State University, rules for research involving human subjects (that's you) must be followed. You are under no obligation to participate in this online survey. Carrie will NOT see who participates on the survey and assures us, and has stated in the syllabus, that participation in the online survey will not be related to your grades in any way.

The purpose of the online survey is for me to see how much experience you have had with collaborative software and what functions you wish to see while using this in class. Do not feel that your opinions will not have any sway over this software. Carrie and I both expect to mold this software piece around your personal needs in this class.

If you are willing to participate in the online survey, take 10 or 15 minutes sometime this week to answer questions anonymously to help Carrie and I to improve the experience. Go to http://commtechlab.msu.edu/humans/ecollab/stusurv/stusurv.html to learn more and get started.

If you do not want to be part of the online focus group, you don't have to do anything.

If you have concerns at any time about your rights as a human subject in TC891, you can contact Dr. David Wright, chair of the University Committee on Research Involving Human Subjects (517) 355-2180.

Sorry about all the legalistic wording and procedures here. In the end it is to protect your rights.

Thanks A LOT!
-m@
Matthew J. Leach

APPENDIX C

ONLINE SURVEYS

Online Survey Questionnaire
(PRELIMINARY SURVEY)
CONSENT STATEMENT

As you have read about in the previously e-mails and on the website, Carrie and Matt have been researching Collaborative software. We want your feedback about InClass. This anonymous Online Survey is part of the evaluation.

This survey uses the MSU Virtual University SIRs technology to ensure anonymity. The system is designed so that each student in the class can answer the survey only one time. Although the system is programmed to let people answer at most one time it is also programmed to prevent us from knowing who participates and who does not participate in this survey – we only know how many total people have answered. Also, your name and ID are in no way associated with your answers.

When formal research is conducted at Michigan State University, rules for research involving human subjects (that's you) must be followed. You are under no obligation to participate in this online survey. Carrie will NOT see who participates on the survey and assures us, and has stated in the syllabus, that participation in the online survey will not be related to your grades in any way.

The purpose of the online survey is for us to see how much experience you have had with collaborative software and what functions you wish to see while using this in class. Do not feel that your opinions will not have any sway over this software. We expect to mold this software piece around your personal needs in this class.

If you are willing to participate in the online survey, take 10 or 15 minutes sometime this week to answer questions anonymously to help us improve the experience.

If you do not want to be part of the online survey, you don't have to do anything. then don't answer these questions! If you do consent to participate, read on and answer the questions below. You can skip any question you are not comfortable answering.

If you have concerns at any time about your rights as a human subject in TC891, you can contact Dr. David Wright, chair of the University Committee on Research Involving Human Subjects (517) 355-2180.

How familiar are you with Flash?
NOVICE INTERMEDIATE EXPERT

How helpful do you think it will be to be connected to classmates while you are learning and working with Flash?
NOT AT ALL 1 2 3 4 5 VERY HELPFUL

How helpful do you think it will be to be connected to the professor while you are learning and working with Flash?
NOT AT ALL 1 2 3 4 5 VERY HELPFUL

How much do you think you will feel like part of a community?
NOT AT ALL 1 2 3 4 5 VERY MUCH

Have you used instant messenging software before (icq, aol instant messenging, MSN messenger service, etc.)?
NEVER OCCASSIONALLY WEEKLY DAILY
If so, what?

Have you ever used chat software before?
NEVER OCCASSIONALLY WEEKLY DAILY
If so, what?

On a typical week day, how many hours do you use a computer?

On a typical weekend day, how many hours do you use a computer?

Not including TC891, how many classes have you taken virtually?

What is your gender? FEMALE MALE

What is your age?

How useful do you think InClass will be for

staying connected to the professor?
NOT HELPFUL AT ALL 1 2 3 4 5 VERY HELPFUL
staying connected to fellow students?
NOT HELPFUL AT ALL 1 2 3 4 5 VERY HELPFUL
getting to know fellow students?
NOT HELPFUL AT ALL 1 2 3 4 5 VERY HELPFUL
working with fellow students?
NOT HELPFUL AT ALL 1 2 3 4 5 VERY HELPFUL
getting fast answers to problems you encounter while learning Flash?
NOT HELPFUL AT ALL 1 2 3 4 5 VERY HELPFUL
sharing excitement about new designs?
NOT HELPFUL AT ALL 1 2 3 4 5 VERY HELPFUL
getting feedback on your work in progress?
NOT HELPFUL AT ALL 1 2 3 4 5 VERY HELPFUL

The course instructions ask you to log in to InClass and stay logged in whenever you are online and doing TC891 work. But plans and reality are not always the same. Without

having used InClass yet, what is your expectation of what percent of the time you will actually log in to InClass while you're online doing class work?

Thanks very much for your time!

APPENDIX D

ONLINE SURVEY CONSENT STATEMENT

Online Survey Questionnaire
(LATE-SEMESTER)

As you have read about in the previously e-mails and on the website, Carrie and Matt have been researching Collaborative software. We want your feedback about InClass. This anonymous Online Survey is part of the evaluation and the LAST thing we will need from you all.

This survey uses the MSU Virtual University SIRs technology to ensure anonymity. The system is designed so that each student in the class can answer the survey only one time. Although the system is programmed to let people answer at most one time it is also programmed to prevent us from knowing who participates and who does not participate in this survey – we only know how many total people have answered. Also, your name and ID are in no way associated with your answers.

When formal research is conducted at Michigan State University, rules for research involving human subjects (that's you) must be followed. You are under no obligation to participate in this online survey. Carrie will NOT see who participates on the survey and assures us, and has stated in the syllabus, that participation in the online survey will not be related to your grades in any way.

The purpose of the online survey is for us to see how much experience you have had with collaborative software and what functions you wish to see while using this in class. Do not feel that your opinions will not have any sway over this software. We expect to mold this software piece around your personal needs in this class.

If you are willing to participate in the online survey, take 10 or 15 minutes sometime this week to answer questions anonymously to help us improve the experience.

If you do not want to be part of the online survey, you don't have to do anything. then don't answer these questions! If you do consent to participate, read on and answer the questions below. You can skip any question you are not comfortable answering.

If you have concerns at any time about your rights as a human subject in TC891, you can contact Dr. David Wright, chair of the University Committee on Research Involving Human Subjects (517) 355-2180.

APPENDIX E

FINAL SURVEY

OVERALL AMOUNT OF USE OF INCLASS

What internet access speed do you have for your TC891 class work?
Dialup 28.8 Dialup 56 cablemodem on campus network

What percent of the time you spend doing TC891 work are you logged in to InClass?

How many hours in the last week were you working on TC 891-related readings, discussions, or assignments?

How many hours of class-related time were you logged in on the Internet?

What percent of the time you were logged in on the Internet were you also logged in to InClass?

How many times in the last week did you get disconnected due to technical problems?

USING INCLASS FOR HELP SOLVING PROBLEMS

How many questions did you ask using InClass in the last week?

In general, how helpful are the answers to your questions?

NOT HELPFUL AT ALL SOMEWHAT HELPFUL QUITE HELPFUL
EXTREMELY HELPFUL

In general, how quickly are your help questions answered?

WITHIN MINUTES WITHIN AN HOUR WITHIN A DAY NEVER

Who answers most of your questions?

PROFESSOR CLASSMATE

PUBLISHING HELP TIPS

About how many times this semester did you use InClass to "publish" a help tip you had prepared to help a classmate?

About how many times this semester did you go to the Help Tips discussion board to try to find a solution to a problem you were having?

If and when you did you go to the Help Tips discussion board to try to find a solution to a problem you were having, what percent of the time were you able to find the answer you were looking for? (leave blank if you never looked there for answers.)

USING INCLASS FOR SHARING COOL SITES AND PROJECT BREAKTHROUGHS

In the last week, about how many times did someone on InClass suggest a cool site to visit?

What percent of the time when someone points out a cool external site did you go look at it?

What percent of the time when someone posted their own work in progress did you go look at it?

About how many times this semester have you posted a cool external site?

About how many times this semester have you posted your own work in progress?

USING INCLASS FOR GROUP PROJECT COLLABORATION

Have you ever used InClass to work with one or a small group of other students on a group project? If so, please tell us your opinion about how effective InClass is for this purpose, and how it might be improved.

USING INCLASS FOR COLLEGIAL SOCIAL CONTACT

How often do you use InClass to have conversations with others in the class?
ALMOST NEVER

An InClass "session" is a continuous block of time when you are logged in to InClass. In what percent of your InClass sessions do you exchange at least one message: (note these percentages WILL NOT add up to 100%. Each one could be 100%)

privately with Carrie through InClass?

with a particular classmate, in one person whisper mode through InClass?

with a group of classmates in whisper mode, and not the whole group logged in though InClass?

with the entire group through InClass?

How often did you use InClass to send email to a classmate or the professor?
ALMOST NEVER ABOUT ONCE A WEEK SEVERAL TIMES A WEEK MORE OFTEN

USING INCLASS FOR ONLINE LEARNING

Here are some reasons for using InClass for Online Learning. Please tell us first how important the reason is to you, IF some hypothetical software package could provide that function really well. Then please rate how well you think InClass meets the reason (whether or not the reason is something you personally care about)

to have instant access to people who can help me solve software problems when I encounter them

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

to have instant access to the professor

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

to be able to get feedback about designs I am working on

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

to get to see fellow students' work in progress

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

to be part of a community of learners interested in class-related topics such as Flash, typography and interactivity

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

to coordinate group projects

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

to make virtual class work less isolated

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

to make class work more fun

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

to see the kinds of questions other students have

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

to increase my interest in the subject matter by seeing what other students like

NOT IMPORTANT AT ALL TO ME 1 2 3 4 5 VERY IMPORTANT TO ME
IN CLASS DOES POORLY 1 2 3 4 5 IN CLASS DOES WELL

INCLASS AVATARS

InClass lets you choose different icons for yourself to express emotions, humor, frustration. How avatars did you create other than the main one created for you before class began?

What kinds of different avatars did you add?

How many times in a typical InClass session did you change your icon?

InClass lets the Professor give you halos and stars. Is this feature merely stupid, a little bit fun, or a good attribute that future versions of InClass should continue to incorporate?
STUPID A LITTLE FUN GOOD ATTRIBUTE

Note: The following questions will look familiar – we already asked them on the last survey -- but the data is anonymous, so we need to ask them again this time to be able to make comparisons statistically within THIS survey.

How familiar are you with Flash?
NOVICE INTERMEDIATE EXPERT

How helpful do you think it will be to be connected to classmates while you are learning and working with Flash?
NOT AT ALL 1 2 3 4 5 VERY HELPFUL

How helpful do you think it will be to be connected to the professor while you are learning and working with Flash?
NOT AT ALL 1 2 3 4 5 VERY HELPFUL

How much do you think you will feel like part of a community?
NOT AT ALL 1 2 3 4 5 VERY MUCH

Have you used instant messenging software before taking TC 891 (icq, aol instant messenging, MSN messenger service, etc.)?
NEVER OCCASSIONALLY WEEKLY DAILY
If so, what?

Have you ever used chat software before taking TC 891?
NEVER OCCASSIONALLY WEEKLY DAILY
If so, what?

On a typical week day, how many hours do you use a computer?

On a typical weekend day, how many hours do you use a computer?

Not including TC891, how many classes have you taken virtually?

What is your gender? FEMALE MALE

What is your age?

Thanks very much for your time!

APPENDIX F

EMAIL FOR FINAL SURVEY

Email Subject: TC891 SEX SEX SEX

Hey Classmates!

I HAD to get your attention here! (Cheap attention get'er)

Look, I NEED your help here. In order for me to graduate, I have to finish my thesis. In order for me to finish my thesis I need to collect responses to the final online survey about inClass. You're under no obligation to complete this anonymous survey, and neither Carrie nor I will know whether you did or not.

But I really want to write up results for a significant number of respondents, not just one or two.

Filling out a survey about InClass that will ONLY take a few mins. Promise.

You can jump to the survey by following this link:
http://tc891.vu.msu.edu/web/finalsurvey.htm

GREAT Thanks!!!
-m@

Second email for final survey:

Subject: InClass

Hey (Each email personally addressed to student),
I know you received an email from me earlier today, but I'm really counting on you to fill out my survey. Just take a sec to go to:
http://tc891.vu.msu.edu/web/finalsurvey.htm

Thanks again,
-m@