ON AUDIENCE ACTIVITIES DURING PRESENTATIONS

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ABSTRACT

Audiences have most likely always been subject to distraction and drift during all varieties of presentation. While these activities were often confined to solitary activities since inter-person distractions were limited by their visibility to the speaker (ever been caught passing notes in class?), in the current networked-enabled presentation room, multi-person off-task "distractions" are now possible (ever read your e-mail during a conference talk?). This paper explores the potential for positive effects of this ability; back-channel discussions that are on-topic and can even lead to a more involved audience and better interaction with the presenter.

1. INTRODUCTION

Audiences have most likely always been subject to distraction and drift during conference talks, classroom lectures and presentations in general. Personal observations show there exists quite a range of available distractions. From doodles and word games, to working on various writing projects, to intellectual pursuits, to computer solitaire, to checking e-mail, to instant messaging as examples, an audience member has always been able to find something to do other than listen to the speaker if the desire existed.

While these activities were often confined to solitary activities since inter-person distractions were limited by their visibility to the speaker (ever been caught passing notes in class?), in the current networked-enabled presentation room, multi-person off-task "distractions" are now possible (ever checked on your e-mail during a conference talk?).

According to Pew reports using data from 2000 and 2001 [8,10], a significant number of online teens were using instant messaging in general (74%) and many were already using instant messaging for schoolwork (41%). Another Pew report from 2002 [9] showed a high percentage of college students using the Internet and instant messaging. From my own encounters with students (few students reporting having used IM in my non-majors course in

2000 versus at least half reporting having used IM in the same course in 2003) I think it is fair to assume that this number has continued to rise.

Larry Cuban points out a potential conflict between maintaining "obedience" in a classroom, and the notion of encouraging students to think and question what they are being taught [3]. This paper explores the potential for positive effects of a specific use of this ability; back-channel discussions that are on-topic and can even lead to a more involved audience and better interaction with the presenter. By having easy access to your fellow audience members, if you feel you would not gain much by paying full attention to the presenter, it is possible to share thoughts about the current presentation with others in the room. These discussions could actually lead you back to paying more attention to the presentation at hand.

2. DISTRACTIONS IN THE "GOOD OLD DAYS" BEFORE COMPUTERS

For a wide variety of reasons (e.g.: boredom, confusion, disinterest in the topic) an audience member might look for other things to do during a presentation. These can either be wholly unproductive, off-topic productive or on-topic productive.

Traditional "pre-computer" examples of wholly unproductive distractions include doing a crossword puzzle, writing doodles on your notepad, and making up word games (e.g.: "How many words can you make using only the letters in the title of the talk?"). In the next section more examples of this category of distraction will be discussed that are computer and personal digital assistant (PDA) based.

Examples of off-topic productive distractions include thinking about and/or working on current projects of your own, or reading materials related to previous or upcoming presentations (e.g.: at a conference session of three papers where you were only interested in the first and third). It is also possible that something in the room other than the speaker's topic has inspired you to a new project idea. As an extreme example of this, a member of an audience at a talk was wearing a shirt with the word chocolate spelled using letters from the period table of the elements. This led me to work out an efficient algorithm to take an arbitrary set of element symbols and determine whether an arbitrary word could be spelled using them [6].

Examples of on-topic productive distractions include creating new project ideas based upon something that you've just heard. There are times when a speaker's comment sparks a thought relating to your own work, and rather than risk losing the train of thought, you begin fleshing out some of the basic premise. In addition to capturing your thought, this could lead you to formulate a more detailed question for the speaker that would help you apply their ideas to your work.

3. DISTRACTIONS IN THE "HIGH TECH" PRESENTATION ROOM

As laptops and PDAs such as the Palm Pilot and PocketPC have become more ubiquitous, it is extremely common to see audience members using these devices. Foldaway keyboards have made PDAs more common as note-taking devices. However, just as these portable technologies enable note-taking, they also enable distractions.

Curious about how people were using computers to take notes during presentations, I began an attempt to observe their habits. As an audience member I would select presentations at which I would sit at the back of the room in order to observe computer users in the audience. As a presenter in the classroom I would "wander" through the classroom on certain days to glance at the applications being used by my students.

What I found was that although some computer users were typing notes in text editors or word processors, many if not most were doing other tasks. These included playing games such as solitaire and hearts, browsing seemingly random web sites, checking their e-mail, doing instant messaging, editing documents that appeared to be their own conference papers in progress, and programming.

This would have greatly discouraged me except for one thing; I also observed people using pen-and-paper to doodle and work on crossword puzzles. This motivated me to consider what resources could make the computer users less likely to be lead to distraction, especially since (unlike the crossword puzzle solvers) to the presenter, it would be difficult to distinguish note-taking from distraction.

These observations contributed to my curiosity as to whether it would be possible for audience members to capitalize upon their technology in a way that would provide advantages of distraction yet actually keep them on-topic. This curiosity has lead to work on an electronic note-taking system designed for the classroom and conference presentation format [5], as well as the experience discussed in the next section.

4. DISTRACTION THAT CAN KEEP YOU ON-TOPIC AND CAN EVEN ENHANCE A PRESENTATION: A CASE STUDY

The 2003 WebShop was the third annual workshop in a series of workshops organized under the NSF-funded WebUse project [11]. One of the technical challenges of previous years had been providing Internet access to students during their two-week stay. The expectation was that the issues from the previous two summers had been worked out, and students would have Internet access in their dormitory rooms as well as at certain campus 802.11b (hereafter referred to as Wi-Fi) hotspots. However, as a contingency plan, it was decided that the WebShop staff would establish a WebShop-specific hotspot in the main lecture hall. This way, even if there were problems with providing access to the campus network resources, there would at least be Internet access at that location.

The lecture hall for the WebShop had an Ethernet jack with a single static IP address available in the technology closet. Due to the size of the lecture hall and the relatively small size of the audience (under 50), it was decided that a wireless access point with DHCP could be used. It would be assigned the available IP address for the local Ethernet jack, and would then serve as a gateway to the Internet for all students' computers via a wireless network. Once the technical details had been negotiated, an interesting question arose: would the Wi-Fi access point be turned off during the presentations.

4.1 Non-technical issues in making the lecture hall Wi-Fi Internet-ready

The main question/concern regarding keeping Wi-Fi access enabled during the presentations was that some students might select to perform activities such as checking their e-mail or reading their favorite blog rather than listen to the presentation of the moment. The answer to this question seemed obvious at first – we would turn off access while speakers were presenting and have it on before, between, and after presentations. However, we could foresee the potential for many legitimate actions that could be supported by Internet access *during* the talks.

In past years, several presenters showed screenshots of the web sites they referred to in their work. Based on experience with the two previous WebShops (Summer 2001 and Summer 2002), there were times when a quick visit to the site being mentioned could provide an opportunity for a student to quickly establish more context for the issues being discussed. Additionally, keeping Internet access enabled meant that a student could quickly find the answer to a question about a mentioned web site that they might not remember later, or might not want to "waste" time asking about during the Q&A portion of the talk.

Another potential use of Internet access was that if a student had a recollection of a related article or story that they wanted to raise to the speaker, but did not recall the exact details, they could browse over to their favorite search engine or bookmark and refresh their memory.

In the end, we decided to keep access enabled during the entire day and to observe whether problems arose. We also speculated that giving this type of access to a room full of Internet researchers could have some interesting results. The outcomes were indeed fascinating!
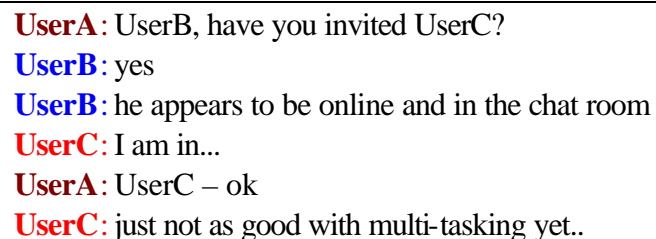
4.2 Interesting outcomes in the lecture hall

Students did capitalize upon Internet access in the room in a variety of ways. While the participants in the following discussion were not taking a computer science course, they were all studying computer-centric topics and were all extensive computer users. The observations of these interactions should transfer well into computer science classrooms.

Before addressing the many interesting and positive outcomes of this experience, it would only be fair to note that as the workshop began, the typical computer use was divided between taking notes on the talks and distractions. Students were checking their e-mail, browsing web pages that did not appear related to the talks, and playing solitaire. However, there was also Internet use that we had hoped for; some students were visiting web pages that had been mentioned during the talk and appeared to be browsing those sites to gain a better sense of the use and purpose of the sites. This was verified anecdotally by observing several students who had done so asking very specific questions during the Q&A period that addressed specifics of the site that did not seem as though they could be constructed without having visited the site in question.

However, towards the end of the first week, something very interesting began to occur. Some students decided to pass electronic notes in class! Starting on the Thursday of the first week of the WebShop, a segment of the students joined in an IM chat room during the presentations.

The chat room began at the suggestion of one of the students. It began with around 5 students during the first chat, grew to around 10 students for the second chat, and then hovered at around that level for the remaining chats. Exact numbers can not be confirmed since people may have joined after the log from which I am going was started, and some chat room members may not have contributed comments.

The result of this chat room included a mixture of back-channel chatting, sharing of references and resources, and micro-discussions on the topic of the current talk. Although it was not without a learning curve (see Figure 1), the students involved claimed it as a great success and an important part of their workshop experience.

UserA: UserB, have you invited UserC?
UserB: yes
UserB: he appears to be online and in the chat room
UserC: I am in...
UserA: UserC – ok
UserC: just not as good with multi-tasking yet..

Figure 1: An excerpt from the first logged chat session.

The chat room also provided for something quite positive; social support. One particularly interesting anecdote is that a student who had a question they did not feel confident about asking the speaker basically asked it in the chat room. The other members of the chat room had a discussion around it and encouraged the student to ask their question. After the student asked their question, she told me that there was no way she would have done so without the encouragement of the chat room members, and that she was very happy that they convinced her to do so. Figure 2 shows an example of such social support in the chat room.

> **User X**: hmm, i'm just not sure why you would ask a nurse to find information on the web for family members? if nurses are surrounded by other medical sources why wouldn't she just ask around, rather than go online?
> **User Y**: good point
> **User Z**: good question
> **User Y**: you should ask her about the social context of this searching - i.e. exactly whatyou point out... why should we view searching in a social vacuum
> **User Y**: interesting - trust and quality is important as liability and reliability become issues
> **User Z**: well put
> **User Y**: User X, ask the social question - if he is interested in sociology, lets embed search in social CONTEXT!
> **User X**: i'll try.
> **User Y**: right on!!!!!!!!!!!!
> **User Y**: now that is sociology!!!!!!!!!!!
> **User Z**: right on!

Figure 2: A chat excerpt showing social support.

4.3 Some speaker responses

Other interesting aspects of this experience were the reactions of the speakers and students.

For the most part, the speakers were unaware of any organized discussion "behind the scenes" in the classroom. In general, we felt this was no different than speakers in general being unaware of what students were doing on their computers during a talk. However, on the second day of this discussion group's existence, one of the speakers came to lunch with the students and a discussion began about the chat room. After lunch the Q&A session with the speakers from that morning quickly moved away from the topics of their talks, and towards the topic of the back-channel discussions in the room *during* the talks.

The speaker's initial reaction was one of seeming anger and apprehension at the thought that the students were talking behind her back while she was giving her presentation. However, as the discussion continued, the fact that the chat room stayed on the topic of her presentation, and the fact that the students felt it added positively to their experience during her talk, swayed her towards enthusiasm for the idea. So much so that she began to ponder aloud whether it would be better to share the chat room with the speaker.

The students, however, were not enthusiastic about this idea; instead, they became apprehensive at the thought that the speaker would be reading what they wrote. Considering

their conversations were on-topic and were reported to be congenial, this reaction was surprising, though not wholly unexpected.

The desire of the speaker to be able to obtain feedback has inspired certain features in projects such as Classroom Presenter [1]. One interaction that Classroom Presenter supports is the ability for a student to send a question or comment to the faculty member indicating not only the question or comment, but also the location on the PowerPoint slide to which it relates [2]. Another project of interest is Conductive Chat [4] which alters the font of text being sent in an instant message session. This application alters the appearance of the transmitted text based on the typist's galvanic skin response (eg: if there is a sudden increase in your excitement level, the font size is increased). Perhaps ideas such as these can be evolved and commingled to provide the speaker general feedback of the audience's state of mind during their presentation so they might gain valuable information, while still allowing students to maintain their comfort level.

4.4 Many different student responses

Equally interesting were the reactions of the students themselves. The students could be divided into four basic groups; with Wi-Fi-ready computers and in the chat room, with Wi-Fi-ready computers and not in the chat room, without Wi-Fi-ready computers and wanting to be in the chat room, without Wi-Fi-ready computers and not wanting to be in the chat room.

4.4.1 Students with Wi-Fi-ready computers and in the chat room

The students who participated in the chat room generally had positive reactions to the experience. They were happy to be able to discuss the topic of the talk with one another as thoughts were fresh in their minds. As was previously mentioned, in at least one case, back-channel discussion led a student to build up a more well-defined question as well as the confidence to ask the question during the Q&A period. This type of community outcome is not unusual, but is interesting to see in this environment.

One interesting outcome from a sociological and psychological perspective was observing the reactions of some of the chat room participants as discussions about the chat room expanded. Although all students were told that the chat room transcripts were going to be saved and looked at, it wasn't until we began discussing some of the chat room interactions and effects as a group that the reality hit home. Though several talks at the workshop had referred to empirical research and ethnographic studies, for many students this was the first time they had been on the "other side" of the observation.

The fact that this became a tense issue among a group of students who were well aware of observational studies opens questions about the social and psychological ramifications of chat room back-channels. Though they provide the potential for more

"anonymous" classroom participation than raising your hand to ask a question, you are not truly anonymous and there is now a record of your conversation. When the question was raised as to whether speakers should be sent the chat room logs for their talk, there was a very negative response and the idea was given no further discussion.

4.4.2 Students with Wi-Fi-ready computers and not in the chat room

Several students had the required technology (or had easy access to it) and still chose not to participate in the chat room. One of the concerns was that carrying on a conversation would serve as too much of a distraction from the speakers. A related issue was an apprehension that the chat room discussions would drift off topic, causing them to be even more of a distraction from the speakers' presentations.

One student who did not have a Wi-Fi card for their computer but was considering purchasing one said, "I did, however, occasionally look at the chat on AnonStudent's computer. It seemed to stay on topic and provide some additional information but not enough to warrant me buying one myself." This leaves an open and ultimately unanswerable question, would this student have tried it out *anyway* if he already had a Wi-Fi card for his laptop?

4.4.3 Students without computers or without Wi-Fi cards who wanted to be in the chat room

There were several students at the workshop who wanted to participate in the chat room, but were unable to due to our very own digital divide. Some students didn't have laptops available in general. Others did not bring theirs since they didn't think there would be a need for them. Additionally, of the students with their laptops present, not all of them had wireless cards. According to one of the students, when he went to the local Radio Shack (the only electronics store within walking distance) to try to buy a wireless card he was told that there had been a run on them and the store was sold out. Since it was during summer break, we're pretty confident that the other students at the workshop created the run on wireless cards.

Being that one of the topics of discussion at the workshop was the digital divide and related issues, the fact that we had a divide of our very own at the workshop led to several spirited discussions on the topic. Our divide was not simply one of "haves" -vs- "havenots" in general. It also included "haves" that didn't have *access* to their computers, and "haves" that did not *want* access to their computers (see next subsection for more discussion on this matter). These were aspects of issues that several students hadn't considered before as part of the question of a digital divide.

Several students without access to the chat room expressed the desire not to be "left out" of the experience. One suggestion was that a projector and computer should be brought in so that the chat room could be displayed at the front of the room, next to

the speaker's presentation slides. This would make them all "lurkers" within this online community. One of the workshop speakers, Jenny Preece, had presented the topic of lurkers [7], so it was tempting to attempt this.

In the end, however, we felt that having the chat projected at the front of the room raised too many uncertainties to be willing to explore the idea. We were concerned that the speakers would not react well to this unexpected and possibly undesired setting. We were also concerned that it might prove to be too great a distraction, and would in essence force everyone in attendance to participate in the chat room.

4.4.4 Students without computers who did not want to be in the chat room

One of the interesting outcomes of our conversations on the question of using a chat room to enable back-channel discussions was a discussion of proper behavior of an audience. Several students felt that it was rude to use a computer in any fashion during a presentation. This included note-taking, which they felt they could accomplish just as well with pen and paper.

This meant that several of the students on the "other" side of the digital divide at the workshop were there intentionally. This too led to some interesting discussions, primarily about proper classroom etiquette. When asked if they would have participated in the chat room if they were provided with a laptop for that purpose and were given permission to by the speakers, several students still said that they felt it was not appropriate to do so. This raises a very interesting question about what it means to be a member of the audience at a presentation. It also raises important and valid questions regarding the introduction of new technologies to an environment when it is neither the *access* to the technology nor an *inability to use* the technology that is the "barrier" to the technology's use.

5. CONCLUSIONS AND FUTURE WORK

On the whole, providing students with Internet access in the presentation room during the presentations seems to have been a success. Had the discussions after the first two mornings of the chat room's existence concluded with objections from students who were not in the chat room, we would have turned off the wireless network during the presentations. If another workshop is held, we would like to offer this chat room experience once again. However, this time we would need to discuss the logistics of informing the students in advance, as well as carefully consider how to handle any objections on the part of the students or speakers.

Two questions need to be asked regarding the length of this experience as well as the goals and maturity level of the students. This chat room community began after the students

knew one another for almost a week, and then existed for about a week. During that time the students self-reported that the conversations stayed on topic and amicable. It is impossible to make sweeping conclusions from this singular experience. The community could have worked (or failed to work) in very different ways.

Questions to ask include the following; "What if the students had not socialized before creating the chat room?", "What if the community had continued for a longer period of time allowing the thrill to wear off or for the community to splinter?", and "What if the members were not carefully selected graduate students with a shared central interest?"

6. ACKNOWLEDGMENTS

7. REFERENCES

[1] Anderson, R., Anderson, R., Hoyer, C., Simon, B., Videon, V., and Wolfman, S., "Lecture Presentation for the TabletPC," Workshop on Advance Collaborative Environments, 2003.

[2] Anderson, R., Anderson R., VanDeGrift, T., Wolfman, S., Yasuhara, K., "Promoting Interaction in Large Classes with Computer-Mediated Feedback," Computer Support for Collaborative Learning, 2003.

[3] Cuban, L., "Teachers and Machines: The Classroom Use of Technology Since 1920," Teachers College Press, 1986.

[4] DiMicco, J.M., Lakshmipathy, V., Fiore, A.T. "Conductive Chat: Instant Messaging With a Skin Conductivity Channel." Poster Presentation, Conference on Computer Supported Cooperative Work. New Orleans, LA, November 2002. http://web.media.mit.edu/~joanie/conductive-chat/conductive-chat-CSCWposter.pdf

[5] Golub, E. The BIRD Notetaking System. http://www.cs.umd.edu/~egolub/AVIAN/BIRD

[6] Golub, E. Making words out of the Periodic Table. http://www.cs.umd.edu/~egolub/pt.html

[7] Nonnecke, B., and Preece, J. "Lurker demographics: Counting the Silent." Proceedings of the SIGCHI conference on Human factors in computing systems. The Hague, The Netherlands, 2000. http://doi.acm.org/10.1145/332040.332409

[8] Pew Internet & American Life. "The Internet and Education: Findings of the Pew Internet & American Life Project." September 2001. http://www.pewinternet.org/reports/toc.asp?Report=39

[9] Pew Internet & American Life. "The Internet Goes to College: How Students are Living in the Future with Today's Technology." September 2002. http://www.pewinternet.org/reports/toc.asp?Report=71

[10] Pew Internet & American Life. "Teenage Life Online: The rise of the instant-message generation and the Internet's impact on friendships and family relationships." June 2001. http://www.pewinternet.org/reports/toc.asp?Report=36

[11] WebUse. http://www.webuse.umd.edu