Whispers in the Classroom

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Introduction

"Let's face it — our school doesn't have a book for everything." —Autumn[1]

Online chat rooms are a novel communication medium that provide an opportunity to transform classroom learning in unexpected and powerful ways. Youth are a demographic of highly engaged, core members of the "always on" crowd—active users of the internet, instant messaging, video games, and social networking sites. Numerous studies have documented how young people use instant messaging and online chat rooms in their personal lives. Some youth today perceive technologies to be entirely new and in the position of setting unprecedented opportunities for interactions online. One high school student stated that, "I can't see how people in the past survived without digital media." Similarly, another asserts that, "My generation, those born in the early 90's, are the first humans to be so profoundly impacted by today's new technology."[2] Their familiarity with and enthusiasm for these tools suggests a valuable opportunity to examine how such communication media can be transferred into more formal educational settings to enable both formal and informal learning through student discussions and interactions online. Students can learn from one another through collaborative knowledge sharing, while educators can use the tool to gain more insight into what and how their students are learning. Kyle, a high school teenager from Wyoming, captures many of the most important factors in chat room use when he says:

Chat rooms can be a way to experience intelligent conversation and try out new ways of saying things, often without having to deal with the fear of being wrong or being laughed at. Kids are using this great tool to enhance personal relationships based on simple dialogue. I'm not going to encourage such behavior, but it is better than what could be going on. Chat rooms and other forms of online communication provide a launching pad for the great thinking minds of America's youth, with little or no consequence for failure.[3]

As wireless networks have been introduced in conference halls, hotels, university auditoriums, and in particular, the classroom, laptop users have realized that they do not have to sit idly during a lecture or presentation. Behavior can range from surfing the Web and checking e-mail while blatantly disregarding the frontchannel speaker to actively engaging in the frontchannel discussion through concurrent related discussions, debates, fact checking, resource sharing, and collaboration. The recent surge in interest has generated a number of conference-based case studies that look to describe the implications of backchannel chats.

Participants in these conferences have expressed a wide range of opinions about the usefulness of the backchannel in context of the frontchannel discussion. Similarly, a number of educators have considered the effects of unrestricted wireless access in the classroom, and some have attempted to incorporate these technologies into their lectures and lesson plans.[4] However, little research has been conducted on how chat rooms affect learning experiences and environments. Chat rooms could transform how course material, learning behaviors and practices, and interactions between students and teachers, fundamentally change the ways in which teachers and students create and disseminate ideas, knowledge, and understanding. This chapter first describes a backchannel chat room that has taken place over multiple years in a large university student community and then explores some unforeseen and exciting opportunities—as well as possible limitations—for redesigning teaching and learning practices in educational environments.

Background: What is a Backchannel?

Chat rooms can be accessed through any Web-based chat sites or by downloading a chat client to one's computer and then connecting to an online server through this local client. Internet Relay Chat is a client-based chat environment that enables groups of people to collaborate and chat from any physical location. It was first used in the 1980s and has since grown into one of the most popular real-time chat systems around the world. It is a multiuser system where people meet on channels to talk in groups or privately. There are no restrictions on the number of people who can participate in a given discussion or the number of channels that can be formed. Chat room conversations tend to be thought of as ephemeral and impermanent due to their synchronous nature. The interaction is rarely thought out in advance, and conversations occur spontaneously. Similar to face-to-face conversation, there is little archiving of chat conversations. Although chat logs may be maintained, they are rarely referred to after the chat has occurred.

   The central function of the backchannel chat room is its use as a secondary or background complement to an existing frontchannel. The frontchannel may consist of a professor, teacher, speaker, lecturer, conference panel, or other similar environment containing a centralized discussion leader who is usually colocated in the same physical space as the participants. The frontchannel usually implies a single focus of attention. The backchannel can function to enhance the frontchannel discussion by encouraging user participation and interaction, changing the dynamics of the room from a strictly one-to-many interaction to a many-to-many interaction. Activities in the backchannel may include establishing guidelines, inviting participants, excluding outsiders, posing questions, providing answers, critiquing what is being said in physical or digital communication channels, or sharing information and resources.[5]

   With a thorough understanding of the opportunities and limitations of the backchannel, educators and instructional designers could transform the classroom experience from a passive lecture model to one of active, collaborative, and engaged knowledge production. Students can learn through a different communication medium, while educators can use the tool to gain more insight into what and how their students are learning. Some questions addressed in this chapter include:

▪   In what ways does chat augment class discussion and how can this information be used by educators?

- What can chat data say about classroom interactions?
- What types of interactions occur in this backchannel and how do they contribute to the academic learning space?
- How does this communication medium change techniques for information and knowledge sharing?
- Is there a compelling story to be told or is it simply noise-wasted bandwidth that distracts participants from their face-to-face environment?

A Case Study in a University Backchannel

The notion of "the academy" as an institution of modern higher education has been transformed from a tradition of an intellectual quest for truth, philosophy, and the arts, with an often stark and disciplined rigor into a socially-oriented, student-empowered learning space. The sense of entitlement in the modern undergraduate student is significant. They want to be able to select which courses they are taking, participate in fully-funded sports teams, have access to clean and often luxurious living standards, and complain if an academic setting has a dearth of social options, food selection, or entertainment opportunities. Such is the environment at the university described in this case study. It is an internationally renowned academic institution, highly sought after by undergraduate, graduate, and faculty scholars.

A student set up a designated Internet Relay Chat channel at this university in which fellow students could easily chat together in an online social environment. No specific purpose or use was attached to the chat room, and an automated login welcome message simply declared that it was to be used by university community members and guests. The chat room experienced an enormous surge in traffic within a matter of weeks. Activity then maintained an overall steady state, amassing a few hundred postings on any given day, and generating a total log of over 300,000 user entries within the first year. In the following year, the new incoming class quickly assimilated into the existing virtual community, integrating into and redefining its culture and social dynamics.

Students login throughout the day, during class, outside of class, and in the evening. With the goal of better understanding patterns of behavior, chat log users and time stamps were plotted in information visualization software to highlight trends in adoption and usage within the classroom. In figure 1, user count is plotted versus the first six weeks of the spring academic semester, showing a general increase in user participation. This suggests that students become more engaged in the chat room community over time. Figure 2 shows total entries by user. The curve shows a power log trend in behavior, indicating that a few users participate most often.

While these tools help to measure quantitative trends over time, they do not help to shed light into the constantly evolving, organic, and unstructured social dynamics of the chat room. In this environment, there is no sense of ownership, nor is there a moderator or leader within the virtual community. It is a self-generated, self-sustained, and thriving online community. Nobody anticipated that from this community would emerge a powerful new genre of computer-mediated learning. As students became comfortable with the affordances offered by the chat room, while simultaneously developing a growing sense of community through their physical social interactions, the channel was unintentionally appropriated into a space for self-directed learning. It provided an open and unrestricted bandwidth through which to engage in a professor's lecture. They had created an environment that was rich
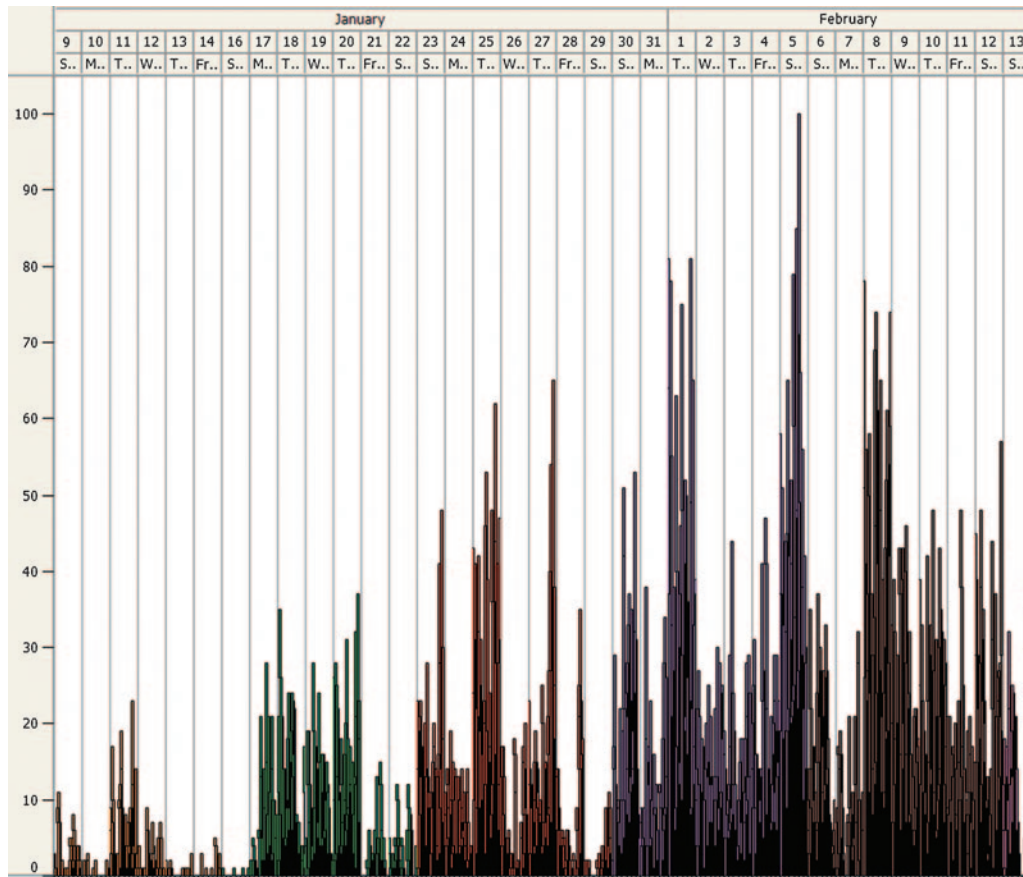
Figure 1
Number of chat entries over first six weeks of spring academic semester.

for collaborative learning and knowledge production, a communication medium through which to engage in active, creative, discovery-based learning. Students who may have been too shy and inhibited in the physical classroom had an opportunity to express themselves in the backchannel. The chat room transitioned from a simple tool for social communication to a tightly knit community. This conversion was both unanticipated and unexpected and elicited a wide variety of reactions from students and teachers. They were surprised, confused, curious, excited, eager, and intrigued. Regardless of their perceptions, there was a clear lack of understanding about the future of the backchannel in classrooms, but nonetheless, a sense of enthusiasm about its potential for change.

The backchannel presents a unique toolkit through which people can create, identify, and filter new modes of interaction. Young people adopt and appropriate new forms of communication technologies and digital media in order to experiment with their self-identity, develop their social networks, and nurture their personal friendship and relationships. This suggests a powerful opportunity for engaging them by incorporating these practices into new classroom teaching and learning paradigms. The emerging experiences offered by this
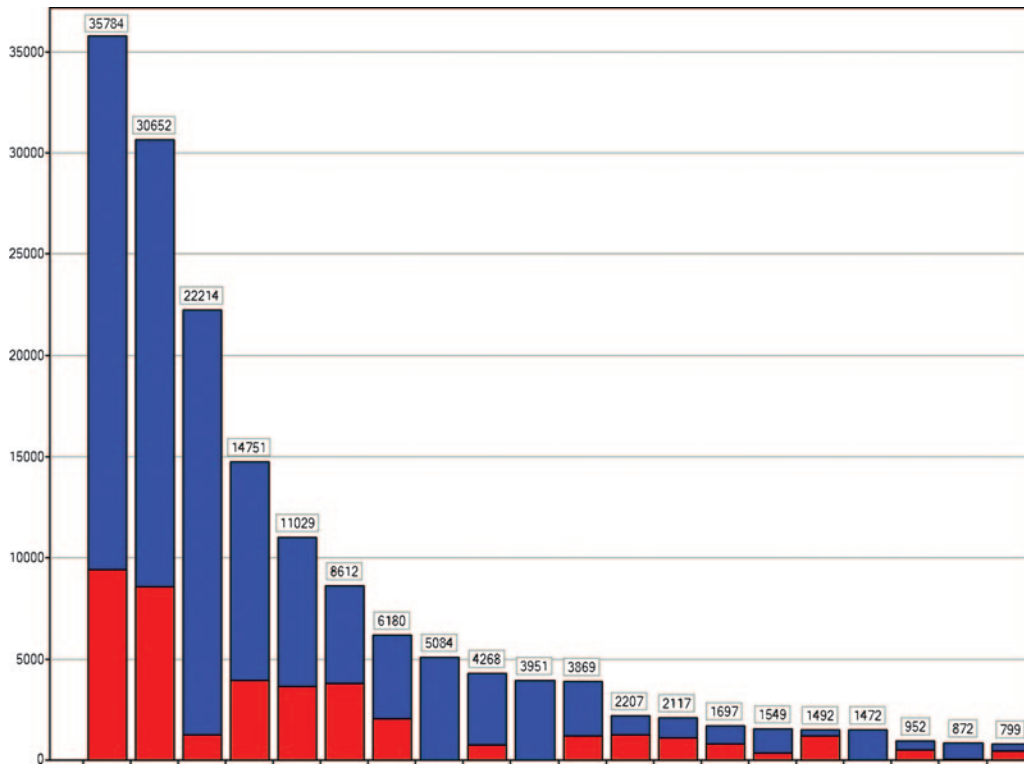
Figure 2
Total chat entries by user over one year.

digital backchannel offer an exciting space in which to explore new directions in collaborative learning. In light of the increasing role of new media technologies and computer-mediated communication as ubiquitous tools in our everyday lives, researchers need to address the need for a better understanding of how these tools can be incorporated into the classroom environment to facilitate enhanced teaching and learning.

Historical Background: Conflicts and Context

Conflicts in backchannel use have their theoretical underpinnings in historical and ongoing power struggles over who maintains ownership and control within the classroom. Should teachers run the classroom or should students direct their own learning environment? Can the two pedagogical models coexist? Educational pedagogy has evolved over time in parallel with the cultural, societal, and governmental influences in which it is embedded. For example, Pink Floyd's famous and controversial song, "Another Brick In the Wall" reflects the counterculture sentiment of its time with a chorus line: "We don't need no education. We don't need no thought control. . . . Teacher! Leave the kids alone. Hey! Teacher! Leave the kids alone!" As the lyrics suggest, the traditional educational classroom setting has historically been perceived by some as an environment of oppression. Friere describes such oppression as banking, in which students are the depositories and the teacher is the depositor.[6] In this model, students are given agency only so far as to receive, file, and store the deposits, rather

than to engage in creative, transformative, and knowledge construction processes. Students are force-fed facts and information, required to regurgitate the teacher's personal mantra. Unmotivated students fail the system and uninspired students may despise the system. Students who learn to work within the system align themselves on the fast track to success.

More recently, teachers, educators, parents, and policy makers are paying increasing attention to the implications of enabling online access in classrooms. In the wake of recent legislative acts, such as the No Child Left Behind Act[7] and the Deleting Online Predators Act,[8] the question of ownership and regulation in schools is revisited in this context of internet use. These acts seek to protect youth in their online environments and to enable more equal access of these environments to all students. Yet, by demonizing the negative effects of youths' online activities, these laws may have inadvertently caused a culture of fear and moral panic surrounding online environments that limit the potential for designing powerful and novel learning opportunities that take advantage of Web-based opportunities, such as chat rooms and backchannels. Despite the negative perceptions that are frequently perpetuated by mainstream media, the large majority of youth are not looking to engage in unsafe behaviors online, but instead want ownership over their online activities. In particular, recent studies show that teenagers are often more aware of the implications of their online activities in terms of safety, learning, and privacy than they may be given credit for.[9] Amber, a teenager from Wyoming, suggests that "technology is changing things so rapidly that the control procedures need to change with it. . . . The only real answers would be the ones worked out by students and adults alike."[10] Dahye, a teenager from Brooklyn, asserts that "we own these new digital medias, we shouldn't be slaves to them."[11] Teens are looking to use the internet to socialize with their peers, for entertainment, and to search for information.

The students who use the backchannel may simply be looking to engage in an environment in the classroom that is not forced, regardless of the actual interactions that play out within this space. Ironically, because regulation in schools prevents free access to the Web, those youth who may be the most in need of free access to information are cut off from the ability to utilize these resources. Furthermore, schools are well equipped to serve students at the most crucial points in their stages of technology adoption, during introductory and educational phases of adoption and when a high quality, reliable connection is otherwise unavailable. Educators are in, perhaps, the best position to be a watchdog for youth's online activities. Educators can teach youth about empowerment and professionalism and the necessary means for articulating and understanding credibility and assessment in their online worlds. A good educational environment requires teachers who motivate their students, facilitate knowledge building, engage participation, and foster a passion for lifelong learning. To deny students this right is to deny them their fundamental right to learn. Such deprivation would be to deconstruct the very premise upon which our economic and cultural existence rests. Thus, the role of chat rooms in the classroom and the contradictory notions of ownership that are suggested uproot the very premise upon which traditional classroom learning has been constructed. The polarization of opinion in who *should* have control in this learning environment can lead to embittered debates that may be motivated by personal agendas and politically and historically rooted beliefs. This chapter, therefore, discusses the role of a backchannel chat room in context of such political divisions, seeking to overcome these challenges to harness the potential of the backchannel as a communication medium for enabling new forms of learning.

The following sections examine some of the potential affordances and struggles surrounding the use of a backchannel in a school setting. These include its role in establishing social

trust and individual identity, its ability to create a sustained sense of space, its function as a site of power negotiations, and its capacity to improve learning using strategies for situated pedagogy and knowledge creation. The section below highlights some of the potential benefits of the backchannel, and is followed by a description of its primary disadvantages that are drawn from the case study environment. These dynamics are then used to explore ways in which the backchannel could be used in the classroom and to dissect the conflicts and challenges in doing so. The final section suggests rules and methods for designing a productive backchannel environment with recommendations for changes in educational pedagogy and teaching and learning styles.

Benefits: Innovations in Learning

As the emerging participatory culture on the internet has clearly demonstrated, new technologies can help to enable equal participation across domains that have previously been restricted to authorities within a particular field. How might this change the classroom learning environment? "People with expertise contributed answers, tidbits, essays, pages of software code, lore of astonishing variety," Howard Rheingold writes in Smart Mobs.[12] People want to establish themselves as an authority on a subject by becoming both producers and authors in digital media. If students can participate in a lecture, how they make sense of the transmitted information will not be the same as if they were simply listening. On one hand, their shared social construction may create a homogenizing of opinions as they share their perspectives with one another. On the other hand, students are empowered to argue, debate, and discuss with one another, creating an environment in which they can take on as much power as they want.[13] Johnson states that "To understand how these new media experiences work, you have to analyze the message, the medium and the rules. What's interesting here is not just the medium, but rather the rules that govern what gets selected and what doesn't."[14] However, without a common ground upon which to understand its power to engage students, enable new modes of learning, and facilitate teaching, the power of the backchannel may be lost as yet another poorly understood medium that is unsuccessful in school environments.

   The potential success of peer-to-peer learning in a chat room is rooted in the theory of constructivist learning. According to this theory, learning is an active process in which learners construct new ideas or concepts based upon their current and past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so.[15] Classes in which students participate in discussions encourage them to go beyond merely plugging numbers into formulas or memorizing terms.[16] Similarly, Brown, Collins and Duguid argue that students learn best when given the opportunity to learn skills and theories in the context in which they are used, then construct their interpretations of a subject, and communicate those understandings to others.[17] In the backchannel, students can create their own knowledge by having the freedom to direct the discussion in ways that are relevant, contextual, and instructional for their own learning purposes. The ways in which students use chat rooms emulate their culture of learning, communicating, and interacting. Peer-to-peer interactions support flexible, learner-centered designs in which learning is active and organic rather than static.

   The backchannel offers students the opportunity to interact with the teacher, the presentation, and one another in a relatively unrestricted, open environment. Far from the traditional presentation environment where they are at the mercy of whoever is standing in front of the classroom, chat offers the possibility for engagement through multiple modes

of transmission. Students can experience a positive engagement with the backchannel, suggesting that they can conduct backchannel discussions that are on-topic, and can even lead to a more involved audience and better interaction with the presenter.[18] Giving students access to a public ubiquitous backchannel also broadens the scope of discourse within the shared physical space. Students are able to ask questions, receive answers, and solicit information without having to interrupt the frontchannel presentation. The signal-to-noise ratio in the frontchannel classroom discussion is improved because only the most important and salient questions are posted verbally, while more peripheral or irrelevant questions can be filtered through the backchannel discussion. Students can ask their peers questions, such as:[19]

10:48:10   Student1: so whats constructionism?

10:48:21   Student1: same as constructivism?

10:48:39   Student2: no, it is more about making things in learning, like learning by building artifacts

Similarly, they can help explain or link relevant material to the discussion topic.

10:51:08   Student1: Did [lecturer] show us where he got his dataset?

10:51:30   Student2: I don't think he did

10:52:17   Student3: but you can find it in [source]

10:52:47   Student2: Actually, I think this is the link

10:52:48   Student2: [URL]

The backchannel provides a means through which to challenge and verify the authority of the teacher without actually challenging him or her explicitly. Students may be more willing to brainstorm over chat when it is considered a backchannel and the social cost of failure or being wrong is low, or at least, is perceived to be low. They also ask questions about material the teacher already covered in class that they may not feel comfortable asking about again.

14:25:10   Student13: what is microformats again? sorry

14:25:59   Student66: http://microformats.org/about/

11:25:29   Student44: what does participatory design mean? I know he explained it but I forgot.

11:25:33   Teaching Assistant: it's a type of design that brings the users into the process

Students frequently shared resources based on their own expertise. In this way, the backchannel can enhance the professor's lecture, without interrupting the flow of the in-class discussion. The backchannel also enables people who have not had a voice, whether because of educational, economic, social, or cultural barriers, to build an equitable reputation in the classroom by participating in the dialogue.

Disadvantages: Distracted Youth or Engaged Students?

Many opponents to using backchannels in the classroom highlight its potential for distraction. Although students have always been subject to distractions during class, in a modern wireless-enabled physical space, the possibilities for distractions increase exponentially. Some participants have suggested the term "continuous partial attention" to describe an audience

member's cognitive ability to pay attention to the speaker's presentation when simultane-ously engaged in the backchannel. Others, somewhat cynically, suggest that "continuous partial inattention" is a more appropriate description.[20] Regardless of how well intentioned a student may be, a backchannel is going to elicit reactions and engagement from the group that will be asynchronous and off-topic to the frontchannel presentation. This can cause confusion and disruption for the students as well as the teacher. For example, in the two admissions below, the students acknowledge that they missed part of the lecture because they were not paying attention.

10:51:22   Student4: Yeah, I missed that, was reading the news headlines

10:51:28   Student4: what's that about usability?

18:42:31   Student6: Wait, what did she say? I wasn't paying attention. Oooh, a birdy . . .

Similarly, the discussion below took place in class but was unrelated to the professor's lecture:

17:31:28   Student12: yeah. I had a roommate who went running with friends and ran like 14 miles.

He came home and was eating honey directly out of the jar. It was funny.

17:32:01   Student12: I never saw an adult eat honey directly out of the jar before.

17:32:1   Student31: i eat jelly straight from the jar sometimes

Furthermore, discussions can become improper and disrespectful. For example:

13:27:32   Student4: i think we should have a goal this semester

13:27:53   Student18: to get [Student3] a girlfriend?

It could be argued that these students would be distracted even if they were not in the chat room. Weighing the costs and benefits of the backchannel in this case may reveal that the chat room is beneficial for the student because he or she is able to ask a classmate about what was missed, rather than simply conceding it as a lost opportunity. At the same time, students recognize that the backchannel does offer an opportunity for distraction that is more exciting and stimulating than traditional forms of distraction, such as staring out the window or doodling on paper. In an unmoderated classroom environment, multitasking online may easily deteriorate into a range of activities that are unrelated to the professor's lecture. One student revealed this perspective:

I do occasionally feel kind of guilty about it, I should be paying attention to the class. Especially when things "get out of hand" people start laughing, I think, "we shouldn't be doing this. . . . " I try not to let it overtake my attention. I don't feel like it's a problem. If I can concentrate, it's helpful. If not, I probably wouldn't be paying attention anyway.

In their study of undergraduate students, Kinzie et al. found that students in the open laptop condition suffered decrements on traditional measures of memory for lecture content even though the students felt they were capable of engaging in on-task discussions and of expressing opinions and exploring instructionally relevant topics.[21] Although students routinely multitasked in classrooms as they attended to lectures, processed the material, and took notes, both students and the instructors expressed some discomfort with discussion occurring synchronously with classroom lectures. Furthermore, students' experience with and ability to use forms of technology will affect their levels of distraction while using it.

For those youth who are advanced chat room users, the backchannel may enable them to intuitively appropriate the technology to maximize their learning experience. Others who have not interacted in chat rooms may expend significant energy trying to overcome the learning curve of the technology before being able to actually engage in the actual classroom discussion. What may be an innovation in technology and practice to one student is familiar, and perhaps even antiquated, to another. Therefore, the use of backchannels may be helpful for some students while others are better off not using it, depending on the personal experiences of each individual student.

Power Plays: Who Rules the Classroom?

In the midst of the pervasive culture of fear that surrounds many forms of popular new media, the backchannel may be perceived to be a medium that encourages transgression. Those who oppose it may argue that to participate in the backchannel is to purposefully upstage the teacher's role in the classroom. Their claims highlight the politically charged pedagogical implications associated with the backchannel. Cohen states that "passing notes in the classroom is probably as old as formal education itself, but the advent of cell phones and other sophisticated handheld devices has elevated this communication to a digital art form."[22] McCarthy et al. similarly suggest that "the term 'backchannel' is a political term, implying not only the existence of a primary 'frontchannel,' but also carrying implications of an unofficial, unwanted, illicit quality. In the lecture-oriented classroom, backchannels have always had a rich life, enabled by the technology of the day—from whispering, hand signals, and note passing, to today's e-mail, instant messaging, and mobile phone-based SMS."[23] The meaning of the term backchannel thus varies with context and usage. To some it suggests an intangible, clandestine community. To others it suggests an empowering toolkit for participation, collaboration, and informal interactions.

There are a number of ways in which the backchannel could be rude or disrespectful to the teacher. First, if the teacher is not aware of the existence of the backchannel, he is placed in a compromisingly uninformed position about the dynamics of the classroom environment. Second, the context of the backchannel discussion could very likely contain negative or disrespectful comments about either the lecture content or personal characteristics of the teacher. Third, as has been described already, students' presence in the backchannel suggests a partial or complete lack of attention to the teacher.

Interviews with professors, teachers, and students revealed a challenging disconnect in perceptions of ownership within the backchannel. There is an ongoing power struggle between teachers and students, both explicit and implicit, which creates a division in approaches to adapting the backchannel in the classroom. This struggle is not new, as educators have always been challenged to maintain a balance of control and power in the classroom. David Labaree, a Professor at Stanford's School of Education, declares that "one reason that teaching is such a difficult profession is that its aim is to change the behavior of the client, and . . . its success depends on the willingness of the client to cooperate. . . . "[24] Teachers can succeed only if they can convince or motivate students to cooperate with them. Given that student attendance is mandatory, many develop an inherent resistance to following classroom instruction. However, existing norms do not necessarily apply to new technologies, and must be reconsidered in context of the affordances of the new technology. Is there a possibility for rethinking and reconstructing teaching paradigms using the backchannel that is satisfactory, even embraced, by educators and students alike?

For example, the introduction of computers in the classroom creates a shift in dynamics from one-to-many to many-to-many between the teacher and the students. In a many-to-many interaction, such as that enabled by a backchannel, student culture dominates over the traditional teacher-generated ecology. Therefore, a self-policing model may be needed to facilitate a productive learning culture. Whether in a lecture or a seminar, students have acknowledged the instructor as the moderator of the discussion and rely on the instructor to provide structure and to manage the discussion.[25] Nonetheless, professors have lamented the use of wireless technologies in the classroom, resorting to banning classroom usage or attempting to turn off access. "Some have banned the technology from classes, some turn off the Internet during instruction, while others struggle through lectures knowing that students are instant messaging, looking at photos, writing papers, and playing games instead of focusing on teacher-relayed information."[26] At the University of Virginia, a law professor decided to turn off wireless access during class times. At the University of Texas, a law professor climbed a ladder and disconnected the wireless transmitter due to his frustration with students' inattention. "Laptops are a real problem," says Charles M. Grisham, a professor at the University of Virginia. "You can stand at the door and see students surfing the web, e-mailing to each other. . . . We wanted to bring this knowledge [technology] into the classroom, but it may be crippling in other ways."[27]

Professors at the university in this study expressed varied opinions about the university backchannel and its use during their lectures. One professor felt that he now had to teach in shorter bursts in the hopes of holding students' attention better. He was not happy about this, since he felt that his subject material required a lot of concentration on complex topics. Another professor, who had not been previously aware of the chat room, expressed discontent at having no awareness of it. This professor asked, somewhat cynically, if she could also be given access to this chat room. She did not appreciate that students might be talking about her without her knowledge. This latter reaction was expressed by a number of professors, lecturers, and teachers. In Golub's study, the lecturer's initial reaction was one of anger and apprehension that students were talking about her behind her back.[28] However, when she realized that the participants in the chat room had been talking about topics related to her presentation, she became more enthusiastic about the idea.

Another university professor confided that the university backchannel was disconcerting for him because he did not know what was being said. "When a whole bunch of people start smiling broadly or snickering, you sometimes go, wait, did I say something weird or what?" He emphasized that he experienced a feeling of disconnection when he did not know what was going on and what people were doing on it. He felt that it could play an interesting role if it were incorporated into the classroom through professor endorsement or a frontchannel display. It would provide an interesting dynamic for teachers and students to combine lecture and debate at the same time. If it were incorporated into the classroom, this professor asked, would it change the entire content of the discussion? "Would it poison the well?" Another professor in the university program expressed a contrasting perspective on the backchannel. He knew that students were chatting online during class because he could easily perceive their engagement with the computers as such. However, he stated that it did not bother him as it did many of the other professors. Although this particular professor did not feel that the possibility that students were chatting about him was a challenge to his authority or self-esteem, many university students we interviewed felt that insecurity could explain a professor's opposition to the backchannel:

Some professors think, "if you don't have anything else to do, then you'll pay attention." I feel like it's almost insecurity, that professors are worried that people aren't paying attention, they get a little pissy about it.

Although it may be partially attributed to their unfamiliarity with technologies, there is also a greater sense of loss of power that could occur. If students are able to direct their own learning styles and materials, the power structure in the classroom could easily transfer from the teacher to the student. While the transition away from a teacher-centric classroom may simply take time to evolve, it could also be argued that it may be time to reinvent teaching. "Faculty may argue that computers are distracting and so should be eliminated from or controlled in the classroom," says John G. Bryan at the University of Cincinnati. "The problem isn't that computers are distracting. The problem is that many faculty work against the computers or in spite of the computers instead of really using the computers to accomplish their instructional goals."[29]

   A better understanding of the social dynamics around the technology is essential to improving its use in the classroom. "We must learn from social trends, capture the power of student–technology interactions, and consider how such relationships engender students' motivation for learning. The stipulation is that we as educators must be willing to reshape our traditional norms of communication, as well as be open to drawing upon skills students bring to the classroom."[30] The backchannel offers a relatively moderated environment in which students can assert some ownership and control over their own learning environment. Given the flux in educational goals and teaching theories, teachers are often uncertain about what skills they are ultimately seeking to enable in students. Is the goal of the backchannel to enable students to be more engaged? To seek out their own fields of expertise? To teach the new forms of media literacy? To take advantage of the opportunity to learn from their peers? The use of the backchannel in the classroom could foreshadow a revolution in the classroom in ways that are as yet undetermined but that harbor real potential.

Building Community Identity

Establishing identity and reputation in a virtual community has long been understood to be one of the most important characteristics to increasing participation and engagement within that community.[31] Social recognition was one of the biggest motivators for participants in the university chat room. The most common form of identity recognition is a participant's username. Core community members rarely change usernames, and when they do it is usually because of server or connection problems with their preferred nickname, and they will choose a similar alternative name. Because of the synchronous nature of the university channel and its very strong sense of community, trust is a crucial dynamic of the backchannel environment. Chat's real-time synchronous affordances make it difficult for people to mask their identity within the community. "Rapid responsiveness in communication begets trust. [Chat] forces rapid response, a basis for trust, which if backed up by short message quality provides deeper context for an initial relationship."[32] For both regular community members and new participants, a sense of trust within the channel is mandated at all times. The auto-message upon login explains the chat room community: "[Chat room name] is the [university name]. If you are looking for discussion of [similar sounding name], you are in the wrong place. Unidentified lurkers will be kicked." This is primarily maintained by requesting all users to reveal their true identity. In fact, all regular users on the backchannel know the real identity of any other user at any given time. If a username is present that

is not recognized by the backchannel core community, users will immediately query the unidentified user to reveal his or her true identity.

17:54:30   *Student23:* hello Student4

17:54:33   *Student12:* whois Student4?

17:54:35   *Student4:* hi

17:54:42   *Student4:* [Student4 name]

17:54:55   *Student7:* Hey!

17:55:02   *Student9:* hi Student7

17:55:10   *Student2:* welcome to [chat room name]s

17:55:10   *Student4:* hello everybody

In a separate episode, two recent alumni of the university who had graduated the previous year entered the chat room to check it out. The current class members knew the identity of the alumni, but the incoming class did not. They immediately questioned the identity of the new participants, but were ultimately willing to trust that they were welcome members of the channel as long as the current members could vouch for their identity.

21:37:58   *–> Student17* has joined

21:38:06   *Student54:* [student17 name]?

21:39:11   *Student17:* yes, [student name]

21:40:22   *Student54:* how's it going [student name]?

21:40:44   *Student17:* good, just checking out the [class] topic of the day

21:41:37   *Student14:* who is [Student17]?

21:41:47   *Student17:* [Student17 full name]

21:42:01   *Student24:* incomings meet the alumni

21:42:09   *Student14:* . . . heh. i don't know who that is, but okay - so long as someone does :P

Other key contributors to increasing trust include rules, personal disposition, history, shared category membership, and roles.[33] In particular, establishing a shared context between users is essential to maintaining trust online. For the university community, the sense of a shared context is easily increased through the daily personal interactions that users experience in their face-to-face environment. By chatting informally in the classroom hallways, during lunch, or in outside social settings, users establish a sense of trust that is quickly transferred to their interactions in the online environment. The sense of shared context facilitates discussions and conversations online. The more shared context participants have, the easier it is for them to negotiate their sense of interpersonal trust and reputation.

You hear an idea, make a joke of it, you've just used something you've just got. Some professors might not like something going on outside of their ideas. Being able to form a joke means you've got it. Some people think it's funny, some don't, it fuels the social network.

There should be a reciprocal relationship between group members and the environment that the chat room provides that will fulfill the social desires of its members for sustained

participation. Social presence is high in the university backchannel. Participants acquire instant gratification, approval, and acceptance upon entering the chat room. For example, a student entered the chat room for the first time over a year after matriculating in the program:

11:09:04   –>Student18 has joined

11:09:34   Student12: wow, guest appearance by Student18!

11:09:40   Student18: ;D

A chat room that is devoid of social affordances will likely lose participants and isolate the remaining members from one another. Regardless of whether this motivation is selfish or altruistic, participants often go to extreme lengths to enhance their social capital with the community, which serves to then build their reputation in the community, inserting them into a cycle of increased participation and acceptance. People tend to categorize themselves as part of the group if the salience of perceived differences among these individuals is minor, relative to the perceived differences to other individuals. Thus, perceived similarities between different university community members concerning attitudes, beliefs, norms, and values, a common task, or a shared history are significant contributors to social identification and group cohesion. Because participants share a physical space on a regular basis, their ability to build a community and recognize other people with whom they are conversing virtually is significant.

Community as a Third Place

Participants in the university chat room were driven by a desire for a sense of community. They may be "searching for a feeling of community that's been lost as many 'third places' which are neither work nor home, but a third place where people congregate and interact, have closed down."[34] Oldenburg describes how many parents and community members have lamented youth's declining participation in community activities, such as Boy Scouts, local Park and Recreation teams, and hobby-inspired clubs, which have instead been replaced with participation in online communities, such as MySpace, Friendster, Doom, Neopets, and countless others. Similarly, adults are participating in online card games, chat rooms, and other virtual communities in place of knitting clubs, poker gatherings, or Tupperware parties, as may have been the norm thirty years ago. For this reason, many chat room participants are using their virtual community as a replacement for the camaraderie and support system previously offered by membership in community organizations. The virtual community offers a home away from home.

In the same way, the university backchannel provided a place for students to develop their third place. Participant usage increased during class time, but also in the evenings. For example, participants often reveal their physical location with other participants, creating a sense of shared physical space, even when participants are not actually colocated. Research suggests that digital technology can improve communication in many ways, such as by providing the "virtual hallways" for students and instructors to meet."[35] Subjects who participate in the backchannel stated that they first heard about the channel directly through a social contact. In these cases, they were approached and specifically told about the channel's existence and how to access it. One participant stated that he originally viewed the channel as a way to meet people when he first started school and did not know anyone in the area. In this case,

he used the channel as a way to actively seek out friends. He perceived the channel as open to any university community member:

I don't think there's anyone that's unaware that it exists. Some people think they'd have trouble concentrating or whatever. I feel like not that it's excluding people, but *including* people. I don't know if that makes sense. People who are on [chat] are more of a group. It's building group cohesion where there wouldn't be one otherwise, but I don't think it's an exclusion.

In contrast, those who do not participate said that they had heard about the channel in public spaces, but did not know much about it. Nonparticipants also stated that their social circle did not use the channel or did not use laptops in class at all. This suggests the possibility of a relationship between *existing* social networks and chat participation. It is not necessarily the case that chat participation mirrors social networks within the school, but they may generate strong ties that reinforce existing dynamics. The sense of community also exists outside of the classroom environment. Participants like to share their evening activities, especially regular daily events like cooking, visits to local eateries, and sleeping. In particular, university students who were single would choose to share their common daily activities:

22:21:18 Student9: I think I might sleep soon

22:21:22 Student9: I know it sounds lame

. . .

22:29:11 Student9: I think I am going to crash

22:29:14 Student23: nite Student9

22:29:14 Student9: see you all tomorrow

This behavior is usually seen in the evenings and outside of class settings when there is a smaller group of core users logged into the chat room. Because the core users are often the same participants every evening, there is a distinct subculture within the university chat room that encourages this sharing of personal lifestyle activities. The offline interactions thus reinforce online interactions as a third place.

Pedagogy of Hope: Designing the Backchannel

How might a backchannel be designed to maximize its potential as a learning environment and tool for both students and teachers? The complex interplay between teacher and student, teaching and learning, and pedagogy and practice creates a challenging but potentially rich learning ecology. Is it possible to design a sustainable backchannel? Can productive backchannel discourse be fostered without being forced? What are the ideal conditions under which a backchannel will thrive given varied classroom sizes, student ages, subject material, and teaching styles? Abrahamson suggests that designing for emergent situativity can help to merge learning pedagogy and scientific inquiry, creating a potential for an engaging, personally meaningful, and authentic exploration into content.[36] Rick and Guzdial similarly highlight the importance of situating a new medium within its sociocultural context, grounding it in the culture of its users and their practices.[37]

However, the inherently clandestine nature of the backchannel is problematic, implying that there is the possibility that it simply cannot be designed for. One might argue that, by definition, a backchannel is only a backchannel if it has evolved organically through its user

community and contextual behaviors. Therefore, in one sense, designing a backchannel is not possible—it is a contradiction in terms. Can a chat room framework be documented or does it have to be learned through experience? Is its emergence and evolution so ingrained in each instance that the only possible form of documentation is through indoctrination? Returning to Friere's antibanking theory of education, it may be that "The important thing . . . is for men *[students]* to come to feel like masters of their thinking by discussing the thinking and views of the world explicitly or implicitly manifest in their own suggestions and those of their comrades [*classmates*]."[38] The backchannel characteristics could be designed by suggesting certain norms, roles, signals, and behaviors, with the intention of encouraging the backchannel community to adopt such practices. The sections below highlight how such characteristics might be designed and implemented.

Rules of Participation

Craig Smith suggests the development of a protocol for virtual classroom etiquette, "chatiquette," which he bases it on research on classroom discourse and conversational turn-taking.[39] While this protocol does reduce the free-flowing interaction characteristic of most chat sessions, it does not constrain the interaction to the extent that often occurs with a designated moderator controlling the chat session.[40] Instead, it allows all participants to monitor themselves and others in contributing to the discussion. The socialized conventions that structure and organize face-to-face conversation are lacking in the online environment of synchronous communication. Without the nonverbal and verbal cues that indicate a request to speak, such as a raised hand, synchronous discussions can become disjointed. In a learning context in which the exchange of complicated or sophisticated concepts and principles is being attempted, a lack of coherence and flow can quickly degrade into worthless chatter or confusion.[41] The university chat room differs from many other chat rooms in that it is highly unmoderated. The original channel creator purposely set it up with few rules or regulations, empowering the chat room participants to develop their own ecological community. The underlying purpose of rules is often about establishing control. Who governs the roles that participants play, how they interact with others, and any sense of ownership within the community?

  The rules of participation are defined by a number of characteristics, ranging from the technology itself, such as rules that are built into the software, to rules defined by the host. Although the university community has no established moderators or community members who are appointed to moderate the discussion flow, a set of rules has evolved, of which participants maintain a general knowledge and awareness. For example, some of the rules were more explicit, such as the automatic message that is sent each time a user joins the chat room. On the other hand, other rules are learned over time, such as identifying oneself if the username does not clearly indicate real life identity, or not repeating certain discussions outside of the users who were present in the chat room during the specific conversation. Over time, the community can rely on the protocol that has evolved through the sense of flow in the chat room environment. Nonverbal cues are constructed online when participants know one another and learn one another's styles of interactions such that the same type of cue becomes equally transparent. An explicit set of rules and protocol can help to build these intuitive practices. This protocol provides a way to make apparent to all participants the usual nonverbal cues used in turn-taking, and in giving and relinquishing the discussion floor. Once the students become familiar with the protocol, they become self-monitoring and self-regulating. Their ability to facilitate this structure and

sustain it emphasizes the importance of building community to create a constructive learning environment.

Guiding the Discussion

Failed exploratory peer-to-peer discussions may occur when ideas are accepted unchallenged or because continuous disputation leads to a breakdown of communication within the group. Exploratory peer discussions rarely broke down in this manner in the university community. As a graduate student community, the learning dynamics are more advanced than those in elementary, high school, or undergraduate classrooms. Failed peer discussions might occur far more frequently in younger learning environments where students are more susceptible to competition or immature group behaviors. In these environments, it would be important to have rules to minimize breakdowns during group communication. These might include guidelines that describe the information, assumptions, tasks, and evaluative criteria for constructive collaborative group work. This could be implemented through the presence of a teacher or teaching assistant within the chat room or a postmortem review of the chat logs on a regular basis in which the dynamics of the group could be studied and improved for future classes. Similarly, the ways in which the backchannel is used in the classroom would influence the types of discussions that took place. One option is to publicly project the chat rooms using one or more screens, where they are separated by comments and questions. In the latter chat room, students could post questions for the teacher. A second option is to use a chat room robot to monitor a channel and provide basic information as well as perform a heuristic analysis of events for postanalysis. For example, entering the command "Define: copernicus" would automatically return a definition from a dictionary lookup robot. A third option is to display the backchannel discussion on the screen in front of the classroom so that students would be less inclined to contribute off-topic postings and would instead focus on the academic discussion. Similarly, a teaching assistant could participate in the backchannel and help facilitate interactions by guiding the discussion and providing scaffolding for the learners.

Assigning Roles

One type of protocol to encourage the development of such rules might be the assigning of roles within the backchannel. Howard Rheingold is designing an innovative new participatory media syllabus (described elsewhere in this series) in which he suggests that assigning roles in a chat room backchannel may help to facilitate order and constructive interactions among students. In an unmoderated chat, students must decide to prioritize a single voice and follow it; in an ideal learning environment, however, all voices would be heard, and none would be disposable, spoken over. Rheingold suggests that students have assigned roles, on a rotated basis, such as "google jockey," "wikipedian," "expert," and "cybrarian." In addition to role assignment, structure in the backchannel may be increased through an informed design of curriculum and uses based on its affordances to minimize disruption and unproductive behavior.

Constructing Culture

A successful learning backchannel must be designed based on the classroom culture in which it is being used. For example, the ways in which a backchannel could be used in a fifth grade classroom will differ significantly from its use in a third-year law class. Teachers may need to implement a more controlled and disciplined environment in younger grades, whereas,

law professors could assume that a Socratic teaching method will effectively command their students' full attention and that the backchannel will therefore be used strictly as a knowledge resource, not as a source of distraction. In smaller groups and seminars, the instructor may choose to explicitly relinquish some of his or her control in order to facilitate a more open discussion, although in these cases students must accept the burden of making sure that the discussions are meaningful and productive. In a small seminar, the backchannel will generally be unnecessary because students are supposed to interact in the physical classroom environment. In a large lecture hall, with hundreds of students, a backchannel could become swamped with too many simultaneous users and conversation threads to be of any use. An ideal class size might be between twenty and forty students, where most know each other and are able to develop a community and sense of trust in their channel, but where there are not so many participants as to weigh it down beyond any academic value.

Teaching Teachers

Education researchers have long emphasized the fact that technology in itself cannot improve instruction.[42] However, technology can enhance the effectiveness of a good instructional design.[43] Many teachers will be more likely to adopt chat room technology in their classrooms if they are first provided support and instruction on how to use the technology.[44] Teachers may need to teach in shorter cycles to hold students' attention. They should adjust their curriculum and teaching styles to provide different and improved environments for scaffolding than the standard lecture format. As students become more accustomed to multitasking in their everyday activities, teachers may find that they need to redesign their teaching styles in order to keep their students engaged. For example, they could intersperse lectures with group activities and individual activities, allotting shorter time spans to each section. A tighter integration of the backchannel may require their lectures to be more permeable, and the right level of focus and formality will need to be determined. As student's learning styles evolve over time and with changes in technology, teachers can adjust their skill sets in order to facilitate ongoing engagement.

Conclusion: The Backchannel, Up Front

The backchannel in the classroom offers an exciting innovative space for a new learning paradigm. There are a number of salient factors that can be taken advantage of to construct a positive learning environment in the classroom. However, as has been shown, it is not a panacea in itself, but must instead be understood within the greater context of its use for it to offer an improved learning experience for youth. This includes the cultural influences within this technology-mediated learning environment, such as ethnicity, gender, access, experience using technology, and individual student personalities and learning styles. Lessons learned through repeated histories of technological determinism remind us that technology does not have inherent preexisting manifestations, but that meaning and implications emerge as computers and social actors come together in different communities. Innovations in its use are only enabled through a complex interplay of multiple requisite behaviors, practices, and external factors. If we can tease out the variable uses of the medium and understand how they influence its construction as an artifact, then can we encourage innovative and unexpected uses? And for that matter, do we want to? Are youths' innovations with digital media a naturally evolving learning opportunity with an embedded unpredictable and exploratory nature that we should encourage? The institutional contexts of the backchannel

are multilayered and complex—from teacher to student to school to parent to district to national standards.

Will Richardson, a teacher, author, and educational researcher, suggests that "shouldn't we hear what [students] are saying, that in a world where the answers to the test are easily accessible that *the test becomes irrelevant*?"[45] Students need to learn how to share ideas and knowledge ethically and appropriately. They need to take ideas that they are taught and make them their own, by exploring and massaging them into their own experiences, as the university students often did on the university backchannel. Richardson continues that, "we need to say to kids 'here is what is important to know, but to learn from it, you need to take it and make it your own, *not just tell it back to me*. Find your own meaning, your own relevance. Make connections outside of these four walls, *because you can and you should and you will*.'"[46] The balance of power in the classroom can be mutually constructed by the student and teacher if both parties are able to facilitate constructive discourse about rules and roles of the backchannel in the classroom. Younger students may not have the experience online through which to develop their own learning environment, although their varied levels of engagement and learning within these environments can be used as a metric for designing the most productive educational experience. As students develop the ability for metacognitive self-reflection on their own experiences, they are better equipped to design and coconstruct their ideal personal learning activities by taking advantage of the varied opportunities that the backchannel can facilitate.

The backchannel may therefore enable a type of education that is progressive but meaningful and has long been needed in the American school system. "It means basing instruction on the needs, interests and developmental stage of the child; it means teaching students the skills they need in order to learn any subject, instead of focusing on transmitting a particular subject; it means promoting discovery and self-directed learning by the student through active engagement; it means having students work on projects that express student purposes."[47] This notion of constructivism may be the ticket to avoiding the learning paradox that plagues much of student motivation in the classroom. Once a student knows how to complete a task, he or she is no longer motivated to learn or participate in that task, and performance in that task will not improve. However, the organic, evolving, and ever-changing dynamics in the backchannel prevent students from succumbing to this sense of stagnancy in learning. Students may be encouraged to learn through a self-motivated eagerness to explore the opportunities and novelties offered by the backchannel on an ongoing basis. Furthermore, as an online, Web-based medium, it allows youth to continuously refine their existing media practices in parallel to their backchannel use. As digital natives, they can produce, consume, remix, and generate their own learning opportunities. They may truly be creating their own classroom of the future.

Notes

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