



Annotated Bibliography Series: The Backchannel

Last Updated 31 Jan 2016

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Recommended Citation:

Katz, Miriam. 2016. *The Backchannel*. Annotated Bibliography Series. UBC Open Geography: Vancouver, British Columbia. <http://open.geog.ubc.ca>.

Summary

-When faculty encourage students to participate online, results are mixed on whether students report more engagement with the material. Also, students may not use Twitter, for example, to engage more with their professor – they may only use it to talk to each other

-One issue is that both students and faculty need to learn how to properly use online tools. Universities will not usually train faculty in that area and students may not have, for example, a Twitter account

-Using Twitter and online discussion boards may lead to an increased sense of belonging to the class, which is especially important with online classes

-Gender is an important factor that needs to be considered - many of the articles have a larger female sample and some studies reported that women tend to have a higher sense of community, which affects learning outside the classroom. Women now make up most of the university student population. Any effort to use Twitter or other technologies should account for that and also make an effort to encourage male participation.

-Many studies do not show examples of tweets, emails, chats, etc. In general, having a somewhat more qualitative approach would be beneficial

-This area of study is still in its infancy; measures need to be put in place to ensure that studies are rigorous and have university support

-Many studies report having the authors or instructors run the Twitter channel, listserv, etc. Having a student (or students) in charge would allow for even more learning to take place.

-In some of the articles, it is unclear whether the author(s) themselves are running the study. They may be running the study on behalf of another professor or they may be running the study for their own class. Giving the articles a more personal touch would help clear that up.

Annotated Bibliography

Camplese, C., and S. MacDonald. 2010. Disrupting the Classroom. *EDge* 5 (4):3-19.

Cited by: 3

This journal article discusses the use of Web 2.0 in classrooms. By Web 2.0, the authors primarily mean social media such as Twitter and Facebook and blogging and writing websites such as Wikipedia. Camplese and MacDonald taught a graduate level class where students utilized Web 2.0 in order to create more of a learning community and to complete assignments. The authors argue that this allows students to be more engaged and to become both consumers, and more importantly, producers of web content. Teachers at all levels can give assignments where students contribute to Wikipedia or blogs and because of one button publishing, as the authors refer to it, it is much easier to make and find online resources. Students can also get feedback in real time from their teachers.

This is a very useful article that shows how backchannel technologies can be harnessed for the benefit of students. One very positive aspect is that, for shy students who do not always participate in class, they can negotiate with their teachers to make their online contributions part of their participation mark. One suggestion that the authors make is that teachers create fresh content for their students on a somewhat regular basis; this may be problematic for teachers who may be teaching many classes and do not have the time to devote to online activity. In addition, the article sometimes jumps between university and K-12 education. Students in all of these levels can be very different and it is important to acknowledge that people will have different skill levels when creating online content.

Davidson-Shivers, G. V, L. Y. Muilenburg, and E. J. Tanner. 2001. How Do Students Participate in Synchronous and Asynchronous Online Discussions? *Journal of Educational Computing Research* 25 (4):351–366.

Cited by: 142

This journal article is about synchronous mode discussions, meaning at the same time but in different locations, and asynchronous mode discussions, meaning at different times. Research prior to this article demonstrated that when using the web to encourage discussion, asynchronous discussions tend to be more productive. Thus, the researchers looked at a class of fourteen graduate students and whether listservs, an example of an asynchronous mode, would be better than chatting. The class was an introduction to trends and issues in instructional design. The instructor did participate in the chats, but the students led them. The class lasted for 15 weeks and in the fifth and fifteenth weeks, surveys were conducted. It is important to note that research assistants coded the discussions, not the instructor. They found that the listserv tended to have more substantive comments than the chats. However, as weeks went by, the students were more responsive and reactive on chat than on the listservs.

The authors make some very interesting points at the end of this article. The class was divided into two groups and conducted both discussions on listservs and chats. Group A had five women and one man; Group B had five men and one woman. Group B had fewer statements and the women in both groups tended to make more supportive comments than the men. This could lead to a separate study about gender norms and online discussions. According to the surveys, the students preferred to chat, though they did report it was sometimes hard to follow. Finally, this article, unlike others, shows examples of what the students said, though they did not differentiate between what was said on the listserv and what was said in the chat. The statements were coded based on what was relevant to the course and irrelevant. For future studies, illustrating examples of asynchronous and synchronous mode discussions separately would be useful, if those are the categories the authors are discussing.

Dennen, V. P. 2008. Pedagogical lurking: Student engagement in non-posting discussion behavior. *Computers in Human Behavior* 24 (4):1624–1633.

Cited by: 118

This journal article looks at the issue of students in online courses, who do not participate actively in online discussions; this is known as lurking. Dennen argues that lurking is perceived as negative, but often reflects engagement with the online discussions. Students who do not post will still read messages and can learn from others, especially when the topic is foreign to them. Dennen compares this to a classroom setting where the quiet students often test well because they are actively listening to others. One benefit of online environments is that students can always go back to old threads and read the messages. For this article, Dennen conducted a study with students in two different education courses, one at the undergraduate level and one at the graduate level. The class met in person a few times, but for the most part, engaged in online discussion. Dennen found that most students posted messages at least once a week, though the professor requested that they post at least three times a week. The graduate students were more likely to click on others' messages, but overall, most of the students were more likely to post messages than to read them. 90 percent of the students reported that they contributed to discussions because they had to, 65 percent because they wanted the teacher to see, 50 percent to express an opinion, and 22 percent so they could work through ideas. The students were also asked why they would lurk: 68 percent to find a message to respond to, 59 percent to find a model to follow, 59 percent to avoid a redundant response, and finally, 56 percent to learn about a topic. Thus, the students who were lurking were engaged in an active learning process.

This article is not solely about lurking; it deals with why students would contribute to online discussions. There are a few flaws that Dennen points out: firstly, the students were asked to fill out surveys about the discussions. This means they self-reported their behaviour, which can be unreliable. Secondly, the students were using the Blackboard program for their discussions and Dennen points out that this program cannot track non-posting activity. Thus, if other researchers wanted to measure lurking without asking students, a different program would need to be used. Finally, Dennen also states that faculty who are in charge of online classes often do not get any sort of support from their university, which has several implications; faculty may not have the time or resources to promote student discussion and learning online, other than giving grades to the amount of participation. As shown above, students will post because the professor expects them to, but this does not necessarily facilitate learning.

De Bruyn, L. L. 2004. Monitoring online communication: can the development of convergence and social presence indicate an interactive learning environment? *Distance Education* 25 (1):67-81.

Cited by: 123

This article discusses how to use asynchronous communication technologies for online courses. In the study conducted for the article, the participants were Australian students in a third year class in Land Degradation and Land Evaluation. Some students lived on-campus while others lived off-campus; the off-campus students were predominantly older, male, and were employed. First, De Bruyn notes that there are many advantages to asynchronous communication: the knowledge is always accessible, anyone can participate, and students can reflect before posting a message. The disadvantages are the possibility for technical problems, communication anxiety, lack of non-verbal cues, time management, information overload, and the occasional reinforcement of traditional roles between teacher and student. For the study, students were given thorough notes and instructions on participating. Two-thirds through the study and at the end, students had to do an interactive activity where they problem solved and wrote a response. The study lasted over two years (2001 and 2002), thus data could be collected multiple times and an accurate picture could be more easily obtained regarding how online activities benefit learning. From 2001 to 2002, the number of new threads actually decreased (from eleven to ten), but the other types of comments increased: replies from 26 to 39, multiple references from 10 to 25. Overall, messages increased from 37 to 48 and threads increased from 22 to 24.

This article was very thorough in its approach. All of the details of the study were given in the article and data was collected over a longer time period than many of the studies in this bibliography. Again, the issue of gender arises: in the first year of the study, 40 percent of people enrolled in the class were women, but they encompassed 56 percent of the contributors online; in 2002, that reversed, but there is no indication of why. It is also noteworthy that the number of new threads decreased in 2002, which may indicate fatigue. Finally, the authors note that 45 percent of the off-campus students reported restricted Internet access, which would have had an impact upon the study. For future studies, this needs to be controlled for.

Donath, J. 2002. A Semantic Approach to Visualizing Online Conversations. *Communications of the ACM* 45 (4):45-49.

Cited by: 209

This article is based on the premise that visual cues aid online conversations. Donath discusses three different programs being developed at MIT to that effect: Coterie, PeopleGarden, and the Loom Project. Coterie, an Internet Relay Chat program, shows how many people are logged in and renders participants as brightly coloured ovals that become brighter when the participants are contributing. The contributions are put into threads on different topics and then, everyone can see which participants are contributing to single threads or multiple threads. PeopleGarden organizes chats in a few different ways: original posts are in red and replies are in blue. Also, if there are people who dominate the conversation, they are shown as large flowers. When there are many contributors, they are shown as smaller plants. Finally, in the Loom Project, the leaders and provocateurs of conversations are shown quite clearly. Donath mentions that one of the most important things in designing these programs is what to highlight and how.

This article is interesting in that it illustrates how chats could be made more visually interesting. However, it does not show any data on how audiences would use it or more specifically, how to use these programs in education. For university students, these programs would be a welcome change from programs used now and they could be used to engage students even more. Coterie especially would be very useful for organizing conversations on different class topics. If teachers at different schools had access to these types of software, it would definitely spice up typical classrooms.

Ebner, M. 2007. E-Learning 2.0 = e-Learning 1.0 + Web 2.0? *The Second International Conference on Availability, Reliability and Security (ARES'07)* (APRIL 2007):1235–1239.

Cited by: 123

This conference paper discusses how to use the tools of Web 2.0 to improve education. Ebner first details what is meant by Web 2.0, namely blogs, wikis, podcasts, and sites such as Flickr and Youtube; essentially, these are all sites where users can create their own content. The main issue that Ebner brings up is that teachers and students are not always aware of how to use the tools and may need some training. Ebner suggests several ways that Web 2.0 could be used in the classroom: blogs and wikis can be used to share personal thoughts and academic work while podcasts could be used to capture both the visual and aural parts of lectures. For wikis, students would be able to contribute and edit people's work, which would ease the editing process.

This is a very good article on the subject matter mentioned. Ebner also addresses the issues that may arise: firstly, if students and faculty are not given proper training in the Web 2.0 tools, they will be much less likely to use it. The tools also need to be convenient and there needs to be motivation to use them. Even when the technologies are used, the way education has traditionally been delivered may not change. Ebner points to the fact that Web 1.0 has not altered education, so why would Web 2.0 be any different? It is important to remember that technology has the potential to disrupt the classroom, for its own benefit.

Ebner, M., C. Lienhardt, M. Rohs, and I. Meyer. 2010. Microblogs in Higher Education - A chance to facilitate informal and process-oriented learning? *Computers and Education* 55 (1):92-100.

Cited by: 354

This article looks at the use of microblogs, such as Twitter, in the classroom. The authors conducted a study of a group of graduate students in Austria while answering the following research questions: How do students use microblogs in their course? Do microblogs foster learning, and can microblogs be used for process oriented learning (POL)? POL entails students directing their own learning with teachers acting more as facilitators, allowing the learning to happen; this is also known as informal learning. Ebner et al. argue that microblogs are good for asking questions, giving opinions, sharing resources, and most importantly, reflection. Thus, for this study, students had to use microblogs and they were graded on how that showed their learning process. The study lasted for six weeks, during which time students made 10,739 posts. Most of the posts were replies made to other posts and much of it was between students, showing a form of informal learning. However, the authors found that only 15 percent of the posts showed the students' learning process.

This article is a good illustration of how microblogs can be used, however there are some pitfalls. Firstly, the students were forced to use microblogs for the duration of the study; the authors themselves mention that "students appeared to be "playing the game" rather than using the tool for their own purposes" (Ebner et al. 2010, 97). This shows that the students appear to be pandering to the researchers rather than genuinely using the technology in a useful manner. In addition, the article does not mention the content of any of the microblogs. Thus, there is no way to know what students wrote. The paper states that there were many private messages and those may have been irrelevant to class

material. Finally, one double edged sword of microblogs is that individuals can share their thoughts very freely, but it may be difficult to know whether they will be read or not. Therefore, if microblogs are to be used in the classroom, it is important that they have a sense of purpose.

Elavsky, C. M., C. Mislan, and S. Elavsky. 2011. When talking less is more: exploring outcomes of Twitter usage in the large lecture-hall. *Learning, Media and Technology* 36 (3):215–233.

Cited by: 65

This journal article explores the use of Twitter in a larger class. For the article, a study was conducted of a communications class with 300 students, titled Media and Democracy. The authors wanted to answer the following research questions: “What outcomes are produced by using Twitter in a large-lecture course? How is the assessment of such outcomes related to the methodological lens utilized?” (Elavsky et al. 2011, 216). The authors first bring up the fact that students are often more engaged with their technology in class because it is more compelling to their identity. Given that Twitter is interactive and its users have increased exponentially every year, the professor decided to introduce it in the class. For the study, the authors used a mixed-method approach whereby four methods of analysis were employed to ascertain how the students used Twitter. By the end of the semester, there were 3207 tweets. The first method of analysis interpreted tweets via statistics. They found that there were 225 unique users, 81 percent of whom posted during class. Only two tweets were directed at the professor, which is telling. The second analysis, which coded the tweets, found that students became more familiar with the technology. In the third analysis, using an anonymous survey, 86 percent said Twitter improved their classroom experience, 81 percent said it made the classroom feel smaller, 78 percent said it increased their engagement and 78 percent also said they got more out of the class because of it. The final analysis interpreted Twitter as a situated technology, meaning that the social and cultural context the students were in had to be considered.

This article is very strong due to all of the analysis methods used. There were however, a few issues. The authors found that Twitter may have actually stifled students who would normally speak up in the lecture. The authors also found that they could not ascertain through the tweets whether students developed a thorough understanding of the class material and whether it informed their thinking. In addition, while the survey indicates

that students enjoyed using Twitter, they may have stated that for the benefit of the researchers and the professor. Finally, 60 percent of students who answered the survey stated that they would probably not make more use of Twitter after the class was over. This shows that while students may have enjoyed it, it may only have been a temporary phenomenon.

Gao, F., T. Luo, and K. Zhang. 2012. Tweeting for learning : A critical analysis of research on microblogging in education published in 2008-2011. *British Journal of Educational Technology* 43 (5):783–801.

Cited by: 82

This journal article examines 21 articles from a variety of publications concerning the use of Twitter in education. Most papers looked at using Twitter in higher education, thus this article is very useful for this project. Gao et al found that the subjects being taught in the courses ranged from language, instructional technologies and design, new media, and business. Most of the sample sizes in the studies were relatively small; seven had less than 50, six had 51-150, and six had more than 150. Most of the studies lasted a relatively short period of time, normally less than two months. The authors cited some of the papers directly - Lowe and Laffey (2011) found that students were normally not engaged when the professor merely posts information; the students need to be invited to contribute. Perifanou (2009) mentions students creating digital stories using microblogging, which shows the potential for students to contribute. In all of the studies analyzed, “researchers found that microblogging increased student-instructor and student- student communication, enhanced social presence, built a strong learning community and largely reduced the sense of isolation among student groups” (Gao et al. 2012, 791).

This article is very beneficial for this project because the authors cite many of the articles used in this bibliography. They point out that many of the studies are of such short duration and that technology can take time to adopt. Thus, future studies should last longer. Also, most of these studies did not have measures in place to determine that the data was reliable. This is very important for showing whether Twitter should in fact be used in education. The articles also did not have a lot of information about the participants, settings, and the types of data analyzed. It is worth noting that only five of the articles showed examples of posts while the rest focused on the number of posts and in which categories they belonged. This should definitely be corrected in future studies.

Gehlen-Baum, V., A. Pohl, and F. Bry. 2011. Assessing backstage - A backchannel for collaborative learning in large classes: A formative study on its usability and influence on students' questioning. *2011 14th International Conference on Interactive Collaborative Learning, ICL 2011 - 11th International Conference Virtual University, VU'11* (September):154-160.

Cited by: 15

This is a journal article in the field of psychology. It assesses whether the program Backstage, a type of backchannel technology, is suitable for the classroom. The authors argue that such technologies can lead to non-disruptive information exchange during lectures. On Backstage, messages can be seen by anyone the user chooses and they can also choose to be anonymous. Professors can also use it to hold quizzes in the middle of lecture to ensure that students are retaining knowledge. For this article, the authors wanted to ascertain whether Backstage is easy to use and if it increases participation in the classroom. Nineteen participants were part of this study; fourteen participated in the Backstage experiment and five constituted a control group. A thirty minute presentation was conducted and during that time, students could use Backstage as they liked. The authors found that students were more likely to ask questions during lecture than the control group and they found that the messages on Backstage were on-topic. They also discovered that the use of the quizzes was favourable for the students and it only took an average of 9 minutes to understand how Backstage works.

This article is very useful in illustrating how backchannel technologies such as Backstage allow for increased participation in the classroom. Since this study was conducted in Germany, it would be interesting to see how students in other countries would use it. In addition, the authors mention that most of the participants in the study were male (fourteen out of nineteen). Does gender have an impact on how much the students use technology? The authors do not address this and it could certainly be the subject of another study. Finally, the authors do address the fact that this group was small compared to large university lectures. How would class size affect the use of the technology? This question could be answered in another study.

Grosseck, G., and C. Holotescu. 2008. Can we use Twitter for educational activities? *The 4th International Scientific Conference of eLearning and Software for Education* :1-8.

<http://www.cblt.soton.ac.uk/multimedia/PDFsMM09/>

This conference paper discusses how to use Twitter in education. The authors mention that as of 2008, there were nearly one million Twitter users, although only approximately half of those members were active every month. In the classroom, there are many uses Twitter could have for students: creating a classroom community, collaboration with other schools, assessing opinion, and sharing thoughts about conferences and research projects. Twitter can also be used to encourage metacognition, or thinking about the learning process. For faculty, Twitter can allow them to give students feedback, engender professional connections, make appointments, and publicize and tweet about events. In terms of the student-teacher relationship, Twitter can facilitate more interactions, allowing students to better understand their teachers. Its downsides are that faculty may need to be available 24/7 due to student expectations, rumours can spread quickly, and the site can be addictive without having any educational value.

This is an interesting paper that gives a sense of how Twitter can be used, however it does not show how students would use Twitter more if given the chance to. In addition, the paper has very few details in it. For example, the authors state that "Twitter has an issue about improving grades or increasing interesting in the subject of teaching" (Grosbeck and Holotescu 2008, 7). There is no elaboration about what this could mean or its implications. This paper could have benefitted from a study with participants or further explanation of its suggestions.

Higdon, J., K. L. Reyerson, and C. McFadden. 2011. Twitter, Wordle, and ChimeIn as student response pedagogies. *Educause Review Online*. <http://www.educause.edu/ero/article/twitter-wordle-and-chimein-student-response-pedagogies>.

Cited by: 11

This online journal article looks at a case study with Twitter and ChimeIn, a program developed by the University of Minnesota where the authors are based. Firstly, Reyerson discusses how she used Twitter in a Medieval Cities of Europe class of 80 students. Before introducing Twitter, only two students would share their thoughts about movies when they were shown in class; on those movie days, most students would not attend class, thus Reyerson wanted to increase participation. She introduced Twitter, with mixed results. On the positive side, attendance increased to between 77 and 79 percent of the class and on those days, research assistants were brought in to observe whether the students remained focus on the film. The research assistants found that the students were indeed paying attention, despite being logged into Twitter at the same time. On average, each student

tweeted three times and 64 percent of the tweets showed thoughtful insights. On the end of the semester survey, many students however did not report benefitting from Twitter, but it is worth noting that 60 percent of the students did not respond to the survey. Many students reported that the use of Twitter was distracting and only 38 percent said that it enhanced interaction between the instructor and students. With regard to ChimeIn, it has many potential advantages but it is a nascent technology. It can generate word clouds and it allows students to respond to class questions using their phone and the Internet. The article shows a few word clouds, but it does not mention specifically whether students enjoyed or learned something from it.

This article made some interesting points about the commercialization of education at the end. The authors argued that when students become consumers, their desire to engage drops precipitously. This may impact many studies using technology. That being said, the studies themselves that were conducted for this article were unimpressive. Reyerson's study would have been greatly strengthened if Twitter had been used on normal class days rather than just movie days; then, a suitable comparison could have been made regarding whether Twitter would be more beneficial for lectures. There is also little indication of how ChimeIn could benefit pedagogical practices. Finally, the authors acknowledge at the end that the use of technology in the classroom may be opportunistic; this is a very good point, but it does not instill confidence in the authors and their studies. If the authors believe that care should be taken when technology is used, their studies should be more rigorous.

Institute, H. E. R. 2007. College freshmen and online social networking sites. (September):1-3. <http://www.gseis.ucla.edu/heri/PDFs/pubs/briefs/brief-091107-SocialNetworking.pdf>.

This document is a research brief from the Higher Education Research Institute. It is useful to illustrate how often first year university students are on social media websites such as Facebook. Every year, the institute administers a survey to first year students about their campus experience and this survey included questions on social media use. It was sent to 31,500 first year students at 114 colleges and universities across the US. They found that 94 percent of students spent between one to five hours on social media in their first year, much less than time spent in class and socializing. The interesting findings were that women were more likely to use social media (84 percent vs 73 percent of men spent at least 1 hour on social media) and black students were more likely to spend more than six hours. In addition, students on social media more often actually spent more time socializing. For students who spent more than six hours on social media, 42 percent spent

time with family, 84 percent with close friends at the school they attended, 32 percent with friends from high school, and 40% with close friends from other universities - these figures are all much higher than students who spend less time online. The caveats were that students online more often also drank more and were less likely to develop good study habits.

While this brief does not deal directly with use of technology in the classroom, it is very useful in order to gauge how much students are online and how that could be harnessed in class. Given that the minority cited in this sample (African-Americans) were more likely to be online, it would be interesting to see if other minorities are also more likely. Also, given that women were online more often, teachers developing activities in their class using social media should be mindful of the effect of gender upon participation. Finally, the authors mention that they do not know if social media use is displacing other activities; future studies could examine that.

Junco, R., G. Heiberger, and E. Loken. 2011. The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning* 27 (2):119–132.

Cited by: 604

This is a journal article in the field of psychology, examining whether Twitter increases university student engagement and grades. The authors first discuss the facts surrounding students' use of social media; they cite statistics that 94% of students use social networking sites, 85% of whom use Facebook. Other studies have shown that increased use of social media often mean that students are more engaged with campus organizations and with their classes. However, this study was the first to examine Twitter specifically. The authors asked the following research questions: "What effect does encouraging the use of Twitter for educationally relevant purposes have on student engagement? What effect does encouraging the use of Twitter for educationally relevant purposes have on semester grades?" (Junco et al 2011, 121). In order to answer these questions, they conducted a study using a group of first year pre-health professional students at an American university. The participants had not used Twitter before the study. The students were given assignments that they could complete using Twitter and they could also ask questions, continue class discussions, give class and event reminders, talk to faculty, and organize study groups. There was also a control group that used Ning, the campus's online system. The authors found that the group using Twitter was more engaged and had higher GPAs as a result.

This is a very valuable study showing how Twitter can be used to increase engagement, however there were a few problems with the experiment design. Firstly, the authors of this paper were given control of the Twitter account. It would have been better if the students were in charge because that would have given less of a sense of researchers watching. In addition, it is not known if these students were active social media users before the study. If students were already engaged with Facebook, for example, their propensity toward using Twitter would be greater. Finally, as the authors point out, this is a very specific sample of students. The study needs to be replicated using different populations in order to understand if these results are case-specific. Regardless, this study does demonstrate that technology does allow for students to be more engaged with their classes and each other.

Jung, I., S. Choi, C. Lim, and J. Leem. 2003. Effects of different types of interaction on learning achievement, satisfaction and participation in web-based instruction. *Innovations in Education and Teaching International* 39 (2):153–162.

Cited by: 397

This journal article is a study of asynchronous interactions online: content-centred, or academic interaction, collaborative interaction, and social interaction. In academic interaction, students receive materials and feedback from the instructor; for collaborative interaction, students discuss their issues on bulletin boards and solve problems together; social interaction entails encouragement and motivation between students and between students and instructors. Using this criteria, Jung et al. wanted to study how all of these interactions affect student achievement, satisfaction, participation, and attitudes towards online learning. The study was conducted with 124 students in Korea in distance learning courses; 66 percent of the students were female. Students were given training on how to use Lotus LearningSpace, which was used to conduct the discussions. Students were grouped into the three interaction types mentioned above, with the academic interaction group being the control group; that group did not receive feedback from instructors. Overall, the authors found that the social interaction group had higher achievement than the other groups, however the collaborative interaction group reported higher satisfaction. The control group reported less participation than the other groups.

This article is very rigorous in its study. The types of interactions were defined ahead of time and strong statistical methods were used to calculate the data. The authors pointed

out that they did not show any of the actual messages, as this paper was more quantitative in focus. Illustrating even one message from each group would have been useful. The authors also pointed out that in distance learning, students are more likely to drop out or fail the class. The fact that students who received encouragement achieved higher grades illustrates how important social interaction is, but collaborative interaction may be more valuable in situations where students attend lectures.

Nobarany, S., M. Haraty, S. S. Fels, and B. D. Fisher. 2011. Leveraging trust relationships in digital backchannel communications. *Proceedings of the 2011 annual conference extended abstracts on Human factors in computing systems - CHI EA '11* :1579.
<http://portal.acm.org/citation.cfm?doid=1979742.1979811>.

Cited by: 2

This conference paper discusses a way to design a digital backchannel that incorporates trust in the relationships among the users. The authors argue that people tend to trust the knowledge and helpfulness of both their friends and the Internet; this backchannel combines both aspects. One of the goals of the backchannel is to decrease the cognitive load of a lecture and increasing the accessibility of knowledge. In this system, anyone can ask a question. Before that, users can rank who in the channel they deem trustworthy. In addition, a discussion can be started and the number of people who join is optional; it can include the most trusted people and others as well. The authors ran a pilot study and users commented that it was enjoyable to contact someone you would normally not ask a question to and that if you target a question to a certain person, it is easier to know what type of language to use. Thus, this backchannel seems to be a very useful way to structure online communication.

There were some drawbacks to this backchannel. Firstly, if the users can deem who is trustworthy and who is not, some users may feel badly that they cannot be trusted. In addition, the authors point out that those users are less likely to have their own questions answered. It is unclear if this can somehow be made anonymous, so that users are unaware as to how much they are trusted by the others. The authors also mention that backchannels can distract an audience and create off topic discussions, however it seems as if the participants in this study used the backchannel for the purpose it was intended for.

Pollard, E. A. 2014. Tweeting on the Backchannel of the Jumbo-Sized Lecture Hall : Maximizing Collective Learning in a World History Survey 1. *The History Teacher* 47 (3):329–354.

Cited by: 1

This journal article discusses the author's experience of using Twitter in her large lecture-based class of 400 students. Pollard first details the use of Twitter in such important events as the Arab Spring, which shows a great potential for using the technology to increase participation. For her course, Pollard started a Twitter account that the students could follow. Out of the 400 students, 150 followed the Twitter feed. Pollard encouraged students to tweet questions during class and she posted links before and after class to articles and videos. According to the statistics she analyzed, tweeting was high at the beginning and end of class as well as 3 hours and 7 hours after the class; the lecture went from 12:00-12:50 on Mondays and Wednesdays. On average, 3.6 tweets were made per day and 20 per month. Overall, Pollard found that Twitter enhanced the class experience. 62 percent of the students who did not have an account still paid attention to the Twitter content and 85 percent of students overall followed the links to articles and videos. One student reported: "I really loved the use of twitter. Personally, I never used it, but I liked that we were given the opportunity to have our questions answered during lecture. Professors don't always allow people to raise their hands (especially in large lectures) because it can get too hectic. I feel like twitter solves this problem" (Pollard 2014, 344).

This article is a very good exercise on how to use Twitter for a large classroom. Pollard considered many factors before deciding to use it and her desire to increase engagement in her class is obvious. The only issue with this article is that few of the tweets from the students were shown. There were some screen shots, mainly of Pollard's tweets, and there was a cloud showing the predominant words that came up on the feed, but it would have been useful to see the students' tweets. At the end of the article, Pollard stated that she was considering making the use of Twitter mandatory for the course, despite the fact that some students reported not enjoying it. Making the use of Twitter mandatory seems to go against the spirit of increasing student participation; for students who choose to participate less due to their own learning style, they would probably respond negatively to being forced to participate.

Rovai, A. P. 2002. Development of an instrument to measure classroom community. *Internet and Higher Education* 5 (3):197–211.

Cited by: 587

This article details a new measurement, the Classroom Community Scale, which measures experiences of community in education. Rovai mentions what the elements of community are: spirit, trust, mutual interdependence, interactivity, shared values and beliefs, and common expectations. These may all be important in distance education, students of which were the participants in this study. The research questions for the study were: "1. How valid is the Classroom Community Scale? 2. How reliable is the Classroom Community Scale? 3. Is there a single dimension or are there multiple dimensions underlying the items that make up the Classroom Community Scale?" (Rovai 2002, 199). The sample size was 375 students who were in 28 online courses. 66 percent were female and the average age was 39, an older sample than most studies. The participants agreed or disagreed with several items using a Likert scale, expressing their sense of connectedness and ability to learn including: "I feel that students in this course care about each other. I feel connected to others in this course. I do not feel a spirit of community"(Rovai 2002, 205).

This study offers insights into how different participants feel connected to their community. Rovai points out that the female students had higher minimum scores on connectedness (7 out of 40) than the male students (1 out of 40). The limits of this study were that the students only came from one institution, so using the Classroom Community Scale at another institution may yield different results. In addition, Rovai showed minimum and maximum scores, however there is no sense of the participants in the middle. There was also little detail given in the results section using language that most people can understand; much of it uses psychological jargon that even many academics would not understand. Explaining the facts in a clearer way would have benefitted the article greatly.

Veletsianos, G. 2012. Higher education scholars' participation and practices on Twitter. *Journal of Computer Assisted Learning* 28 (4):336-349.

Cited by: 121

This journal article examines how faculty use Twitter. A recent survey cited by Veletsianos mentions that about 35 percent of faculty use Twitter. Other studies have found that 60 percent of faculty use at least one social networking site (SNS) once a month or more. However, 74 percent of faculty also mentioned that they do not plan to use social

media for teaching; 79 percent had never used wikis, and 84 percent did not use blogs for class. Overall, 72 percent of faculty use learning management systems that tend to be faculty-centric. This study however wanted to analyse how faculty use Twitter and employed the following research questions: "What kinds of activities do scholars engage with on the Twitter network? What kinds of scholarship-oriented (teaching- oriented and research-oriented) practices emerge from an analysis of scholars' Twitter postings?" (Veletsianos 2012, 339). The researchers employed qualitative analysis to look at 45 faculty in social and applied sciences, humanities, and math with more than 2000 followers. 35 participants taught in the US, with the others in Canada and Europe. In total, 4500 tweets from a nine-month period were analysed. 39 percent of the faculty activity on Twitter constituted sharing information, media, and resources. Faculty also used Twitter to mention and praise their students, post slides, ask questions, and mundane activities such as what book they were reading or which films they were watching.

This article is very beneficial in its illustration of how Twitter is used by faculty. The study conducted for the article was very rigorous in that the three researchers worked together to identify themes in the tweets and a fourth researcher also ensured the accuracy of the analysis. One issue however with the analysis presented in the article is that the themes other than sharing information, media, and resources do not have percentage values attached to them; these are the themes of expanding learning opportunities, asking for help, living social public lives, digital identity and impression management, connecting and networking, and presence across other SNSs. Veletsianos also mentions that there is an issue of causation in the article: Do faculty who want to promote community in education use Twitter or does Twitter foster a community? It would be interesting to conduct a study specifically on that topic. Finally, the faculty who participated in this study had a large number of followers and were mainly men (38 out of 45). Future studies should look at gender differences in the use of technology and Twitter users with fewer followers.

Yardi, S. 2006. The Role of the Backchannel in Collaborative Learning Environments. *ICLS 06 Proceedings of the 7th international conference on Learning sciences* :852–858.
<http://portal.acm.org/citation.cfm?id=1150034.1150158>.

Cited by: 39

This conference paper discusses a backchannel community at UC Berkeley's graduate School of Information (iSchool). Yardi also examines the purposes for having a

backchannel. The research questions are as follows: "What sort of new virtual communities does it enable? What types of interactions occur in this backchannel and how do they contribute to the academic learning community? 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 the face to face environment they are in?" (Yardi 2006, 852). Yardi does not answer these questions in full, but does make some interesting points about backchannels. Firstly, according to an analysis of the aforementioned community, a few of the users tend to contribute the most, which mirrors participation in a traditional classroom. In addition, throughout the six week study, Yardi found that entries increased over the first four weeks, approximately, and then dropped off. She argues that backchannels can be used to increase a sense of community among students and increases peer-to-peer learning. In addition, if a student misses a point that the professor made, they can ask someone else a question on the backchannel about it. Finally, Yardi states that the backchannel can be displayed during the lecture, which would encourage students to stay focused on the academic aspects provided for in the backchannel, leading to fewer distractions.

There are a few things that this article does not address. Firstly, Yardi does not look into why it is that participation in the backchannel at the iSchool dropped off in the last two weeks of the study. Did the students simply become bored? Had they asked everything they would have liked to? This is worth looking into. Secondly, Yardi brings up the term "continuous partial attention" (Yardi 2006, 854), which suggests that any backchannel participation during lecture is a distraction. Yardi also seems optimistic that an online community would lead to a true in-person classroom community. Depending on the group of students, this may or may not happen. Finally, it is worth noting that this study includes only graduate students. More work on undergraduate students should be conducted.