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When the Medium Illustrates the Content: Exploiting the Unique Features of Online Communication

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A decade's worth of online education literature reveals a great deal of consensus on the pedagogical practices necessary to make online courses at least as effective as the face-to-face courses they are replacing. As many authors have pointed out, the principles that govern effective online teaching are similar to those that underlie effective classroom-based teaching. Building from Chickering and Gamson's "Seven Principles of Good Practice in Undergraduate Education" (1987), Chickering and Ehrmann (1996) and Graham et al. (2001) illustrate how these same principles apply to online education, in spite of the fact that online teachers and students rarely meet in person. All three articles argue that effective undergraduate education:

1. encourages contact between students and faculty,
2. develops reciprocity and cooperation among students,
3. encourages active learning,
4. gives prompt feedback,
5. emphasizes time on task,
6. communicates high expectations, and
7. respects diverse talents and ways of learning.

Numerous college educators have incorporated one or more of these principles into their online courses. The Teaching, Learning, and Technology Group has cataloged hundreds of technology-assisted teaching and learning strategies that use Chickering and Gamson's seven principles, many of which are what the group describes as "low threshold"—that is, easy for faculty and institutions to implement. This compendium of successful strategies implemented by online instructors nationwide demonstrates the many ways in which the Internet can support critical thinking, student engagement, and productive group work as well as, and sometimes better than, the face-to-face classroom environment.

In this article, we present the outcome of a formative evaluation of an online undergraduate course in psychology at the University of Wisconsin-Madison (UW) that not only adheres to the seven principles of effective teaching but also illustrates an eighth principle: It employs the unique benefits and constraints of online communication to prompt critical thinking about various facets of human communication, psychology, sociology, and human-computer interface design. Exploring Autism, an upper-level course offered entirely online, benefited from an illuminating association between its content—the cognitive and social experiences of autistic people—and its online environment, which effectively removed the nonverbal social cues that shape face-to-face communication. Being restricted to online

communication helped students understand the complications of communicating when those nonverbal cues are absent or, as for autistic people, difficult or impossible to decode and enabled students to better understand both how those with autism flourish in online communication and the benefits and limitations of online communication for themselves.

Course Goals and Design

Exploring Autism was developed by psychology professor Morton Ann Gernsbacher to familiarize UW students with the latest research on the increasingly diagnosed class of developmental disabilities known as autism. The primary goals of this upper-level course for psychology majors are to expand students' understanding of autism by exposing them to firsthand accounts by autistic individuals and to prepare students to think and write critically about research by having them read and discuss articles by autism researchers, some of which contain conflicting viewpoints or methodological weaknesses. With the support of a part-time technical assistant, Gernsbacher provides regular written feedback on group discussions and individual writing assignments as well as brief, videotaped weekly updates on issues for which students request more guidance.

The course was designed to meet the goals of the seven principles. Frequent assignments, often daily, require students to post information on a discussion board, encouraging contact between the instructor and students (Principle 1). Subsequent assignments, which require students to reflect and comment on other students' discussion board posts, develop reciprocity and cooperation among students (Principle 2). Reciprocity and cooperation among the 45 enrolled students is further fostered by the formation of three- or four-person teams during the second week of the course. The teams are formed alphabetically for the first half of the semester; at the semester break, new teams are created based on student choice. The teams meet weekly in one-hour synchronous text chats, after which each team posts a consensus statement for other teams to read and discuss.

Assignments often transfer the responsibility of finding relevant information from the instructor to the students, thereby promoting active learning (Principle 3). For example, during the second week of the course, each student is responsible for searching online and finding an essay authored by an autistic person and then posting the URL of the essay, along with the student's comments, to the discussion board. Several assignments use a "snowball" technique, in which each student is responsible for locating information that no other student has previously found, implicitly requiring students to be aware of other students' discoveries.

Both the instructor and other students provide immediate feedback on students' discussion board posts (Principle 4). Furthermore, as recommended by Graham et al. (2001), each assignment has a hard deadline to keep students from falling behind or posting commentary after discussion has moved on to the next assignment. Implementing another recommendation offered by Graham et al. (2001), the discussion and writing assignments are highly structured, build upon one another, and focus on questions that illuminate or challenge students' understanding of the course content. For example, after reading the essay "Why I dislike person-first language" (1999), authored by autistic self-advocate Jim

Sinclair, the student teams meet online in synchronous text-based chat to discuss whether society should respect autistic self-advocates' desire to be referred to as "autistic" or continue to use person-first language (i.e., "person with autism") even though some autistic self-advocates object to that formulation.

Students are told from the outset that this fifteen-week course will require a lot of work and that they are required to keep up with all assignments, thereby emphasizing time on task (Principle 5). High expectations (Principle 6) are communicated through a document students are expected to read prior to enrollment and through the instructor's weekly videotaped messages. Students are discouraged from enrolling in the course if they are unable to commit nine hours per week to the three-credit course.

The course's learning activities and reference materials are highly varied in an effort to respect diverse talents and ways of learning (Principle 7). Students read books and essays by autistic people; listen to lectures by autistic people and autism researchers; view documentaries, video clips, and online lectures by the professor and other researchers; read and analyze peer-reviewed and popular press articles; and explore personal Web sites and blogs. In the final weeks of the course, a term project gives students a chance to evaluate and share creatively what they have learned. Like the course's assignments and reference materials, this project, which can be done solo or in a small team, respects diverse talents and ways of demonstrating learning. Term projects can include a research paper, presentation, or portfolio focused on autism; a video production, audio tape, CD, booklet, or Web site intended to inform the public about some aspect of autism; or any other project the professor approves. The instructor's consultations with students about their projects (and eventually the projects themselves) are posted on a classwide forum so all students can see what others have proposed and benefit from others' ideas and feedback. Through all of these features and components, the course enacts each of Chickering and Gamson's (1987) seven principles.

Evaluation Methods

Three semesters of formative evaluation began when the course went fully online in Spring 2004. Julie Foertsch, working as an independent evaluator, asked students to complete an anonymous, 35-question online survey during the last week of class; students were assured that the survey would not be graded or seen by the professor. Across the three semesters of the evaluation period, 105 of 134 students completed the survey, for a total response rate of 78%; the sample was representative on all measures except gender (Exhibit 1). When asked their reasons for taking this course, the vast majority of respondents emphasized their interest in the topic (96%) and the fact that the course met a requirement for their major (87%). The fact that the course was online was an incentive to enroll for 54%; for 54%, this was the first course they had taken online.

In addition to the survey, the evaluator reviewed and thematically coded students' final discussion forum posts, in which students were asked to read two articles about autistic people communicating in cyberspace, reflect on their own experiences communicating online during the semester, and write about what they learned from these activities.

Evaluation Results

Using a 5-point scale that ranged from “Not at all useful” to “Extremely useful,” students in Exploring Autism were asked to rate the overall usefulness of the course in helping them to achieve four learning objectives: developing their critical thinking skills, honing their understanding of psychological concepts, improving their writing skills, and fostering educational interaction among students. Students were also asked whether the course had provided useful concepts, skills, and perspectives for their future experience. Students perceived the course as having the most impact on their critical thinking skills, with 87% rating the course as extremely or very useful in developing these capabilities ([Table 1](#)).

In their written comments, many students attributed this improvement in critical thinking to the intense interactivity and exchange of ideas fostered by the online forum. As one student wrote,

The asynchronous posts have helped me to understand material more comprehensively because I know that what I post will be read by other classmates as well as a professor and that motivates me to work harder so that I do not give a poor presentation of myself for others to see. Reading the postings of other students also has improved my knowledge of the subject because the opinions of others have enabled me to see the material from different angles. This has given me better understanding.

Another student noted, “I think the ‘anonymity’ of the internet allowed all to be completely honest and push their own thinking as well as others as far as possible. I don’t think I would have gotten the same from this course if it were a ‘live’ course.” Students also noted that the online forum provided “the opportunity to really debate topics that can sometimes be touchy or difficult to argue when you are sitting right in front of someone who opposes your views.” Thus, the online forum provided a safe haven for students to evaluate others’ ideas, as well as their own. The online forum also provided access to a greater breadth of ideas than might have been possible in a traditional classroom setting. As one student observed:

I really liked the posts on the class forum. I thought that this was a very good way to convey thoughts on class material and to see what all of your classmates thought about a topic. In the standard/traditional classroom there is only time to listen to a few select students for any given topic. Class would take forever if you were to listen to each person’s feedback on every issue covered. This type of conversation made that high level of interaction possible.

Overall, 79% of respondents felt that this totally online course was extremely or very useful in fostering student interaction, a principle of effective teaching that students often fear will be lacking in their online courses (Bullen 1998; Ward 1998). Similarly, in their written comments, students repeatedly praised, sometimes with surprise, the high level of student interaction they experienced ([Exhibit 2](#)). These comments make it clear that, for many students, Exploring Autism’s online format was more interactive and stimulating than what they had encountered in face-to-face classes.

On the survey, students were asked four questions about how the course compared to other upper-level courses they had taken, all of which were face-to-face courses. (Some

respondents who indicated they had never taken another upper-level course were not included in the analysis). Students' comparative ratings of Exploring Autism indicate that students perceived the class as taking somewhat more time and being somewhat more challenging than other upper-level courses (Principles 5 and 6), yet this perception did not dim most students' enthusiasm for the course, which was rated very highly overall (Table 2). When we looked at which elements of the course students felt were most important to their learning, the three most valued aspects were all enabled by the multimedia and interactive capacities of the online medium: online essays and audio presentations by autistic people, documentaries and video clips about autistic people, and online group chats (Table 3).

Both students' survey responses and their final group discussion postings show how the course's online aspect prompted many to think critically about the dynamics of human communication and illuminated issues that autistics face while communicating in face-to-face contexts. First, many students commented that the online aspect of the course allowed them to be bolder, more engaged, and less self-conscious participants in class discussions. They compared their willingness to express opinions online and in writing in this course with their reticence to participate in face-to-face discussions in other courses where "everyone's staring at you when you speak"—and in turn, they connected those feelings to the experience of autistic people. As one student noted:

I think it's really clear to see just how much the internet helps autistics express themselves. When I think about the chats we've had online, it's funny but I kind of feel the same way. I'm pretty shy in the classroom setting and so it takes a lot for me to participate. A lot of times when a question is raised that sparks a lot of class input, I won't say anything just because everyone else is already talking. I've been trying to overcome this shyness for quite some time, and I think I've really gotten a lot better, but this internet class is great because it offered up a different environment. We all get to post our own opinions, what we want to say, and then essentially we all have a chance to be heard. I really like that. Also, I found that in [the online] group chats I really was quite talkative. I'm not sure why, maybe it's just because it was a little less confrontational and I had a chance to type out and then erase if needed. I got to say exactly what I wanted. I really understand how an autistic would cling to the internet. It's silent, and it gives you the time to respond back, at your own pace when you're ready.

In the same vein, another student said

The communication in this class was extremely vital to really understanding the material, and the way it was set up allowed everyone the opportunity to have an opinion and voice it honestly and openly. Seeing how important the internet was to me this semester makes me all the more aware how important it is for autistics. As a person who is somewhat shy in the classroom setting, and felt very at ease here, I can somewhat (on some level) relate to and understand the way autistics must feel all the time, which, essentially, is one of the main points of the class. Interesting how that worked out.

A much smaller but still significant number of students commented on the challenges of communicating solely online (Exhibit 3). The ratio of students emphasizing the frustrations of communicating online to those emphasizing the benefits was about one to five, but even

those who faced frustration found that they learned something about their own and one another's strengths and weaknesses in diverse communication contexts. As one student put it, "I found the course communication to be strange at first. I just am so used to talking to people face-to-face in class that it seemed weird. Here we are, expressing our opinions without any verbal emotion or gestures attached."

Students in Exploring Autism developed both a deeper understanding of the power of online communication for autistic persons and a reflective understanding of the power of their own online communication—and learning. Based on this qualitative and anecdotal evidence, we propose an eighth principle for effective online teaching in undergraduate education: Employ the unique benefits and constraints of online communication to prompt critical thinking about various facets of human communication, psychology, sociology, or human-computer interface design.

Conclusion

The beauty of a course like Exploring Autism is that it makes one of the presumed negatives of online discussions—the lack of face-to-face interaction and nonverbal cues (Bullen 1998; Ward 1998)—into a reflective learning experience about the nature of human communication and the pros and cons of different media of exchange. Gernsbacher created a learning environment that 87% of 105 upper-division students rated as “extremely” or “very” useful in developing their critical thinking skills; a number of students called Exploring Autism one of the best college courses they had ever taken. Based on our evaluation of student responses to the course, we suggest that all online courses can benefit from creating spaces where students who are self-conscious speakers or more reflective learners feel comfortable and capable sharing their opinions, exploring ideas, and debating controversial topics with others. It is also possible that for many topic areas the ability to think critically about a subject can be enhanced by a combination of synchronous and asynchronous communications, with reduced demand to speak up on the spot or to prepare a written response to which only the instructor will provide feedback. While it remains to be seen whether this eighth principle can be applied across disciplinary boundaries, we are optimistic that exploring the connection between the vehicle for learning and the process of learning has the potential to illuminate many learning experiences.

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Table 1

How useful 105 respondents felt the course was in helping them to achieve its five learning objectives, rated on a 5-point scale where Not at all = 0, Slightly = 1, Moderately = 2, Very = 3, Extremely = 4.

How useful did you find this course in doing the following?	Not at all	Slightly	Moderately	Very	Extremely	Mean (SD)
Developing critical thinking skills	0%	1%	12%	40%	47%	3.32 (0.73)
Fostering interaction among students about course topics	1%	4%	16%	45%	34%	3.08 (0.86)
Helping you learn about and understand psychological concepts and theories	0%	8%	26%	38%	29%	2.88 (0.92)
Developing writing skills	1%	9%	32%	33%	25%	2.72 (0.97)
How useful do you think the concepts, skills, & perspectives you learned will be to you later on?	0%	4%	12%	32%	51%	3.31 (0.84)

Table 2

How 64 respondents who had taken other upper-level courses felt Exploring Autism compared to those courses on four parameters, rated on a 5-point scale where Much less = -2, Somewhat less = -1, About the same = 0, Somewhat more = 1, Much more = 2.

How Exploring Autism compared to other upper-level courses students had taken with regards to...	Much less	Smwhat less	About same	Smwhat more	Much more	Mean (-2 to 2)
How much time it required	0%	8%	27%	38%	28%	0.86
How challenging it was	0%	2%	52%	33%	14%	0.59
How interesting it was	0%	2%	30%	22%	47%	1.14
How much the student learned	0%	2%	31%	19%	48%	1.14

Table 3

How 105 respondents ranked the various elements and activities in the course with regards to their importance to students' learning, rated on a 5-point scale where Not at all = 0, Slightly = 1, Moderately = 2, Very = 3, Extremely = 4.

Course element	Mean (SD)
Essays, articles, and audio presentations by autistic persons	3.84 (0.40)
Documentaries or video clips about autistic persons	3.49 (0.62)
The online/real-time interaction that occurred during Chat Group discussions	2.84 (0.90)
Preparing your Term Project	2.82 (0.99)
The feedback on your work that you received from the professor	2.73 (1.00)
Working on assignments with your 3-4 person groups	2.71 (0.87)
Essays, articles, and audio presentations by individuals who study autism	2.63 (0.79)
The professor's videotaped lectures and comments	2.59 (0.99)
Reading and responding to your section mates' posts	2.47 (0.96)
The feedback on your work that you received from other students	2.17 (1.03)

Exhibit 1:

“I truly believe we all have gotten something out of this class and I find it amazing still that none of us have even seen each other! I honestly feel like I've learned more about people and had more in-depth conversations than any other psych class I've taken in my college career. Like some other people, I've taken other online classes and some have been pure video or purely a joke. But this class was way different, even more so than many discussions I've had in classrooms...The assignments have all been very effective in integrating fun and many, many hours of learning from the articles...Honestly, this course goes right up there with my favorites I've had in college...I am so happy to have gotten to be a part of this class, especially my last semester, and to really learn so much that I know will change the way I think the rest of my life.”

I have taken two other 'online' courses (one actually being more video-formatted) before this one. The differences between this class and the others are dramatic! I really enjoyed this course, and the discussion format it is based upon. I have learned so much by reading the thoughts and opinions of other students through posts, as well as during our chats—more than I think I ever could in a typical classroom setting, even in comparing it to another 411 I have taken, and definitely more than I have in my other online courses. My other online classes were basically the same thing as regular classroom courses, but instead all the lectures were put online. I had no interaction directly with the professor, and absolutely no interaction whatsoever with other students. This class, in opposition, provided me the opportunity to interact with other students much more frequently. Further, in discussion-formatted classes (such as the other 411s) there is always the expectation that you speak a certain number of times throughout the semester, and of course you have 20-some people staring at you while doing so...When thinking about the pros and cons of this course, I thought back to my many discussion groups and lectures over the years. It seems, looking back, that I had far too many 'zoning out' moments in those other courses and was too often tempted to skip class altogether.

Exhibit 2:

“Throughout the semester we have had the opportunity to communicate to each other through the Internet rather than in the classroom. Like autistics, this has been a much easier form of communication. In the classroom we are not allotted a whole lot of time and opportunities to question things and voice our opinions. Often times we may feel intimidated to say what we feel on a particular subject. Having this course on-line has allowed us even more opportunity to communicate with one another than a normal classroom. With our weekly posts we have several chances to think critically and put our opinions out there for everyone to see.”

“When I first signed up for this class I thought that there would be significantly less communication given that I would never come face-to-face with either my professor or classmates; however, I have expressed my opinion and heard more opinions in this class than any other class I have ever taken. I have a very hard time talking in class; it's difficult to think when my blood pressure skyrockets momentarily. In this way, I can empathize with autistics; this medium is a breeding ground for ideas normally bottled up by social difficulties. It's also much easier to focus on the topic when thoughts, or dare I say judgments, concerning others and myself don't pop into my head so much. I also feel like I was able to take my time, and proofread my comments before hitting the send button. That was nice.”

“For me, I was really excited about the set up of this course. In a discussion setting I tend to get shy and not join in as much (although I am not a shy or quiet person). I felt this allowed me to contribute more than what I normally would have. In addition, I think it made me put extra time in and take more notes on readings so I could contribute more. Hopefully I can take what I have accomplished to the next level to face-to-face meetings and be more confident with my ideas.”

“I wasn't sure what to expect with the sole means of communication for this class being via the Internet. I thought it might be difficult to learn materials without actual lectures, but after a couple weeks I realized that the Internet actually facilitated MORE communication and allowed us to learn from dozens of people, not just one professor. I enjoyed being able to allow others to ‘hear’ what I had to say without the social pressures of being on-the-spot and in person. I can say that this means of communication has much less pressure than group interactions or class presentations. This allows us to simplify and get to the meat of the material without getting caught up in nervousness, delivery of information, facial expressions, intonation, etc.”

Exhibit 3:

“The chatting format I found difficulty with due to the fact that it was on-line and not in person. During a conversation I rely on intonation and facial expression and non-verbal signals to determine meaning. This is not possible on-line. I often found that my message was not conveyed or mistakenly interpreted. I can see how Internet communication would be wonderful for autistics who are not able to interpret these non-verbal and get distracted/confused by them. I often felt like the on-line chats made me ‘disabled.’”

“I found the course communication to be strange at first. I just am so used to talking to people face to face in discussions/class that it seemed weird. Here we are, expressing our opinions without any verbal emotion or gestures attached. Now, however, it seems like I actually kinda ‘know’ the people in my groups. When I see them tomorrow, it won't quite be like meeting for the first time. We have been able to express ourselves through words. However, I feel that things can be misinterpreted on the Internet as well.”

“The asynchronous posts were easier than the synchronous ‘chats’ because they were/are simply writing one's thoughts, perceptions, opinions, etc. There was no feedback, no one to ask questions etc. The chats however, were much more lively and yet, many times my ideas flew faster than my fingers could type. Spelling errors abounded, and at times, I would run out of room and the computer would signal that I was done (whether or not I actually was). I would become frustrated at times, and wondered if this is how it must be for one who is non-verbal, and yet intelligent, and has to go through the manual act of writing to communicate with others.”