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Offering Multiple Test Trials: Educational Folly or Learning Opportunity?

By Aimee J. Luebben, EdD, OTR, FAOTA

Using multiple test trials was something I had never considered but found in a newly assigned course with an old syllabus. The previous course, which consisted of 310 total points, included 140 (45 percent) testing-based points. In addition to a 100-point final exam, there were four 10-point quizzes. I was intrigued by the quiz design format that involved availability for a week, unlimited time, and multiple attempts: up to three times with the average score added to the grade book. I wondered whether allowing multiple test attempts was an educational folly. But for 13 percent of the course points, I decided to investigate patterns of student usage and performance before dismissing a new idea.

The quizzes were designed to move students through assigned learning materials. I redesigned the quizzes to test higher-order thinking skills. Setting up the quizzes for multiple attempts took some time and research into the online manual of the electronic course management system. I realized I had used the default (grade-of-last-attempt) in the past

and found some other interesting options available. After the first quiz, I finally found the average-of-grade option and magically transformed the grade book with one click.

Of the 20 students enrolled in the course, multiple trials (at least two) were utilized by 13 (65 percent) in the first quiz, 12 (60 percent) in the second quiz, eight (40 percent) in the third quiz, and seven (35 percent) in the fourth quiz. When comparing the average first attempt to the average multiple trial score, I found variation in student performance. Students improved their scores by an average of .71 points (close to a full letter grade) with multiple attempts on the first quiz versus a negative result (-.03) on the third exam, and two smaller gains for quizzes 2 (+.23) and 3 (+.24).

The syllabus also gave students an option of stopping if they liked their scores on the first attempt. Using a 10 or 9 (the lowest A performance for the course) as a cutoff score, I found that nine (45 percent) students stopped with a “liked” score in the fourth quiz compared with three (15 percent) students in the first quiz. In the first quiz I

CONTINUED ON PAGE 8 >>

TIPS FROM THE PROS

8 Ways to Increase Social Presence in Online Teaching

By Hong Wang, PhD

Social presence is an important concept in distance education. It means being there, either physically or virtually. Gunawardena and Zittle (1997) found that social presence is a predictor of student satisfaction in a computer-mediated conferencing environment. Using Short, Williams, and Christie's (1976) definition of social presence, Gunawardena and Zittle explained that social presence refers to the degree to which a person is perceived as a “real person” in mediated communication. The degree of social presence of a communication medium is affected by the capacity of the medium to transmit information about facial expression, posture, and other nonverbal cues. Two concepts, intimacy and immediacy, are associated with social presence.

How can we increase social presence in online teaching? Here are some ideas for you to try.

A welcome letter. It is helpful to send a welcome letter to your students or post it on the online

CONTINUED ON PAGE 2 >>

3
Using Clickstream Recording to Make Learning Visible

4
Online Teaching Fundamentals: You, Live: Pump Up Your Online Courses, Part 1

6
Teaching Online With Error: Keeping Your Classes on Track During the Holidays!

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<< TIPS FROM PAGE 1

course site at the beginning of the semester. This will make online learners feel welcome and sense the instructor's virtual presence from the very beginning of the course.

A personalized introduction.

As instructors, we all know that it is important to hold students' attention in the first class, and this can be accomplished through many techniques such as an interesting teaser, an overview of a well-planned course, a display of a fun and humorous personality, and more. Unfortunately, not all online instructors realize the importance of attracting our online students and presenting ourselves as virtual instructors in an online learning environment.

Together with a paragraph introducing yourself, it would be nice to add a still image, a hyperlink to a home page if you have one, an audio clip, or a video clip to add a human touch to the online classroom.

Make good use of email.

Email can be used in three ways in online teaching: class email, group email, and individual email. Class email is "email broadcast" according to Horton (2000). It is used for important announcements such as schedule changes or correcting misunderstandings or misconceptions. Group email can be used to provide students ideas, guidance, or feedback on group projects. Individual email can be used for many situations such as answering individual questions, providing feedback on assignments, motivating students to learn, and following up with students for special situations.

Use course announcements frequently. Making announcements in a Web-based course is another way to connect with the students. I have been trying to

post one to four messages each week, depending on what and whom I teach.

Take advantage of the discussion board. Most online instructors use the discussion board, but not all of us are active in participation. It is important to get involved in the discussion and engaged in the conversation, commenting on students' posts and guiding their learning. We continue to explore how to use discussions effectively. The ways I have tried include both group and class discussions; having a group leader facilitate the group discussion; summarizing the group discussion; and sharing with the rest of the class, using a rubric to grade discussions.

Use synchronous communication to enhance social presence.

Immediacy is a critical element in social presence, and communication in real time often enhances social presence when handled well. The synchronous communication tools I have used for teaching include Blackboard Virtual Classroom, Elluminate, and DyKnow. Depending on the purpose of the synchronous communication session, we may choose different tools and set different times. Blackboard is good for text-based messaging and good for a start. Due to Blackboard's lack of audio and video functions, Elluminate can be a better choice. Some instant messaging tools such as Yahoo Messenger can be also used for synchronous communication.

Try Web 2.0 tools for fun and collaboration. I tried blogs for a couple of classes, and I've found students enjoyed it. They had fun and a sense of achievement in creating their own blogs. Through the blog creation and communication, there was more interaction between students as well as

CONTINUED ON PAGE 5 >>

Using Clickstream Recording to Make Learning Visible

By Kimberly J. Eke, PhD

The ancient Greek philosopher Heraclitus once observed that “many fail to grasp what’s right in the palm of their hand” (Von Oech 2003). For those of us straddling the fields of IT and education, we have new opportunities to measure learning—all around us! We only need to see them.

This article explores the use of clickstream recording and data analysis to make online learning behavior visible to instructors, researchers, and learners. A clickstream is a record of a learner’s activity and is a source of data used widely in the field of Web analytics. The methodology is relatively easy to implement, provides a unique view of learner behavior that complements more traditional learning assessments, and is particularly suited to the online environment. For those developing Flash-based materials, it is the logical next way to demonstrate instructional value.

Teaching and Learning (TL) Interactive, part of Information Technology Services at the University of North Carolina at Chapel Hill, develops custom instructional materials that advance the mission of the university. In close collaboration with UNC’s Eshelman School of Pharmacy, TL Interactive has developed six Flash-based online multimedia modules to help students master complex content for the course Foundations in Pharmacokinetics. Modules are designed to engage students in core concepts outside of class, freeing valuable in-class time for concept application via discussion, problem-solving, and critical-thinking exercises.

Each module includes approximately one hour of fully narrated animations, practice exercises, quizzes, and a variety of course tools,

including a glossary, calculator, graphing tool, and equation helper. The online learning environment is password-protected and contains a back-end database external to the campus learning management system. Each time an individual logs into the modules, data recording begins: time-stamps, scenes completed, practice exercises responses, and quiz scores are collected using custom AMF-PHP scripting. (AMF stands for Action Message Format, which is used to exchange data between an Adobe Flash application and a database; PHP is a widely used computer scripting language.)

Demonstrating value

Learning assessment is no longer optional. Recent demands for increased accountability and academic analytics (Commission 2006; Norris et al. 2008; Campbell, Deblois, and Oblinger 2007; Campbell and Oblinger 2007; Green 2006) as well as accrediting bodies’ requirements for clear evidence of learning has put higher education institutions on notice. As learning environments move online, new methods of assessment are necessary. Furthermore, for fee-based groups, demonstrating value and return on investment are essential to success. And for online learning environments, Web analytics—and specifically clickstream analysis—hold great promise.

Research shows that the best instructors gauge their effectiveness based on students’ learning progress (Bain 2004; McKeachie 2002; Davis 2001). While learning is typically measured with traditional assessments (i.e., research papers, essays, tests, and quizzes), subjective experiences and interactions with students in the classroom are also important. Students’ body language and expres-

sions indicate understanding, boredom, confusion, curiosity, or engagement. Instructors use such signs to modify their instructional behaviors accordingly. At the classroom level, changes in behavior (whether student or instructor) cause changes in patterns of instruction and learning.

What happens when a key part of the learning process moves from the classroom to the online environment? How do students’ online behaviors indicate when they are bored, confused, curious, and engaged?

“Seeing” online learning

Clickstream recording and analysis provide a much-needed window into the world of online student behavior. By collecting statistics such as page views, time-on-task, successful attempts on practice exercises, and a variety of other metrics, we can begin to “see” how students use multimedia modules. This ability is a great benefit to instructional media designers and developers—as well as to instructors. At a glance, instructors can review aggregate class data such as quiz scores, module completion rates, or most-repeated content. Then they can modify previously planned lessons in order to address problems students are having—problems made visible by the data.

Consider how little instructors currently know about students’ interactions with online course content (Retalis et al. 2006). With clickstream data, however, reports can be generated on demand by instructors *and students*. Students can use these statistics to track their progress relative to the rest of the class. This serves as a source of motivation for many students—encouraging them to change their behavior in ways

CONTINUED ON PAGE 7 >>

You, Live: Pump Up Your Online Courses, Part 1

By Patti Shank, PhD, CPT

When teaching and designing courses, I find that it's easy to slip into autopilot and use the same tools and strategies over and over. Autopilot can be comfortable and easy, but I know I don't do my best work in that state. So I try to look at my courses and materials with fresh eyes as often as I can. Often, I'll ask another faculty member or designer to look at what I'm designing with a critical eye, and I return the favor for their courses.

If you teach or design online courses, you may be looking for ways to do things differently as well. Maybe have more fun. Engage yourself and your students more. In this series of articles, I'll discuss practical ideas that you can adopt or adapt for your own courses.

The first thing to do may be to think differently about how your courses should work. Get out of a rut or the don't-fix-it-if-it-ain't-broke way of thinking. I face some typical objections when I try to convince instructors and instructional designers to try new approaches.

Why fix it if it ain't broke?

Some folks tell me it's silly to mess with what works. Thinking through how you can do whatever it is you do better is a mark of professional excellence in any field. Do you have courses that lack "umph"? Where students seem to just be going through the motions? Too many dropouts or no-shows? Then it's past time for making some changes, and I'm hoping to help.

Some instructors tell me that their subject matter is inherently boring. No subject is inherently boring. Courses are boring if the instructor is bored or boring.

Courses can be boring if the content and assignments are unimaginative. Courses are often boring if the course content and assignments aren't connected to the world around us.

Like Hallmark says, "When You Care Enough to Send the Very Best"

We'll start our journey by looking at one approach that can be used to improve the connection between you and your online students early in the course.

In many online courses, it takes a while for students to connect with the instructor and other students. Asynchronous communications (typically through email and discussion postings) take time—time for a reply; time to understand what someone means; time to get a feeling for the course, instructors, and other students. And this delay makes some students, especially those who are new to online courses, feel like they are in a large city but are all alone. This can be a huge problem, and it's one we don't do enough to rectify. Students who begin online courses with concerns—about the difficulty of the content and course, about using unfamiliar course systems, and about staying motivated and on track—are worried and looking for reasons to either be less worried or jump ship.

Research shows that online course dropout rates are affected by many things, including not being firmly engaged and successful early on. There are many ways to create opportunities for early engagement, but the opportunity to be engaged *live* with the instructor and other students early on can short-circuit the time and effort needed to feel connected (and likely to stay) as well

as allay concerns about learning online.

You may think this is crazy. Your students may be all over the world. And they typically take online courses because they want the flexibility to attend whenever it is convenient for them. But chances are that quite a few do want to connect with you and will go out of their way to do so.

There are numerous tools that can help you connect live with students. You can use them to do introductions early on, answer questions throughout the course, hold office hours, meet with members of project teams, and so on. Some of these may be available within your course management system, but if these tools aren't available or are available but don't work too well, there are free or very inexpensive tools that can be used to be "live," as shown in table 1 on the following page.

Organizations and institutions are already using these kinds of technologies to connect students and instructors in ways that are more impactful than asynchronous modes of communication (many use both synchronous and asynchronous methods). For example, the United Nations Cyberschoolbus (www.un.org/cyberschoolbus) employs webinars and live video chat to connect instructors and students around the world on global issues. Oprah Winfrey recently used Skype to hold online meetings with thousands of her fans and Eckhart Tolle, an author and speaker.

How might you use these synchronous communication tools? For starters, consider using them to "meet" your students online at the beginning of a course so that they

CONTINUED ON PAGE 5 >>

Table 1

Tool type	Use and possible tools
Online meeting	<p>Online meeting tools can be used to hold online meetings at the beginning of the course and throughout.</p> <p>Some options:</p> <p>Dimdim www.dimdim.com</p> <p>Vyew http://vyew.com/site</p> <p>Yugma www.yugma.com</p> <p>GoToMeeting www.gotomeeting.com</p>
Audio and video chat	<p>These tools allow synchronous voice discussions with or without a video and can be used in a similar manner as meeting and webinar tools.</p> <p>Some options:</p> <p>SightSpeed www.sightspeed.com</p> <p>Skype www.skype.com/allfeatures/videocall</p> <p>Tokbox www.tokbox.com</p>
IM (instant messaging)	<p>Although chat and instant messaging are hard to follow if more than a few people are involved, they can be used to provide “live” office hours throughout the course if only a handful of students are expected to participate at a time.</p> <p>Some options:</p> <p>Google Talk www.google.com/talk (can also do PC to PC “phone” calls)</p> <p>Pidgin www.pidgin.im</p> <p>Trillion Basic or Pro www.ceruleanstudios.com/learn</p>

<< FROM PAGE 4

can become connected early. You may need to do this more than once to accommodate your students’ schedules, but chances are, many will attend.

You might ask your students to prepare for a live meeting by bringing a 29-word bio to share. I made up the number—this makes the assignment mysterious but also cuts down on the time needed for introductions. And ask each participant to come with one question about the course topics, process, or assignments (that you will answer). Try to keep the meeting short and fun. Then follow up with an email with details from the meeting such as answers, questions, and interesting facts students shared about themselves. (You may want to have someone else taking notes so you can be fully present.)

What do you think? Will this idea work for you? How can you tweak it so it will?

Look for more adopt-or-adapt things you can do to pump up your online courses next month.

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<< TIPS FROM PAGE 2

between the students and me. Some of them maintain the blog and keep communicating with me and other students even after the completion of my course.

A concluding remark and best-wishes statement. After the final exam, final project, or other type of final learning assessment at the end of the semester, always remember to send all students an email or a class announcement. This message functions as a conclusion of the class. From a welcome letter to a wrapping-up best-wishes statement, you as an instructor show your social presence at both the beginning and the end of the class.

This list is by no means exhaustive. These are just some things I’ve used in my own online teaching. You are welcome to try these ideas!

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Keeping Your Classes on Track During the Holidays!

By Errol Craig Sull

The Christmas song is titled “It’s the Most Wonderful Time of the Year,” but it could easily be extended to include the months of November and December so as to encompass both Thanksgiving and Christmas/Chanukah/Kwanzaa. And although this period has always been one of two times that finds students having difficulty focusing on their studies in a face-to-face classroom (the other: the few weeks prior to summer recess), in the online classroom this can be an especially difficult time to keep students engaged, serious, and committed to all assignments and all deadlines. For while students in the face-to-face classroom know they must be in X classroom on Y days at Z time each week—no matter the month—the casual setup of the online classroom can bust wide open if not addressed during these holiday months.

We can easily fall prey to the same frivolities, obstacles, and special circumstances the holiday mood can bring on. If not properly curtailed while we teach, our classes could be less productive, students will be less involved, and we will not be as satisfied with our efforts. Here’s how to keep your classes on track during the holidays.

Stay within your established schedule. Students need order in any classroom; the syllabus, your class schedule, and the course website offer a stability that students can count on. Through these the students know where to go for course information, where to turn in assignments, and with whom they can interact. If any of this is out of whack it can be upsetting to the online student and his or her tie to the course, especially during the holidays when extra

outside influences are all around. So maintain your regular schedule and same course requirements.

Post a motivational email and announcement. Be sure to indicate to students the importance of giving these holiday weeks their “all” and remind them of the overall impact on their final grade from *each* week’s work. Also, ask for any heads-up on absences or delays due to holiday travel or guest visits: the more you know ahead of time, the smoother you can run your class(es).

Use the holidays to reinforce the subject taught. No matter your course’s subject, it will appear in print, in the movies, in song, or on TV during the holiday season—and you must jump on it to reinforce the import of the subject. This allows you to connect to the holiday season but in a way that emphasizes the real-world applicability of your subject.

Give students course-related “gifts.” There is a host of either subject-related or just-plain-fun websites you can send to your students as holiday gifts; you can also find cartoons, jokes, puzzles, and light articles—again, all related to the subject taught. It’s a nice way to strengthen the rapport between you and your students, show you are part of the holiday spirit, and give something that merely offers a chuckle or some additional information on the subject taught.

Invite students to exchange “gifts.” This can be much fun, help students develop new friendships, and offer another item that keeps students involved in and enjoying your course. Whether through assigned pairings or simply having each student give a “gift” to the rest of the class, letting students exchange or send helpful/just-kinda-cool websites, articles, and information can add a nice holiday

touch to your class.

Be sure to call your students (if allowed). Many schools allow—and some encourage—faculty to call their students, and what better time to “just call to say hello” than during the holiday season. This not only shows you as a warm, caring person but also allows for an additional and personal interaction with your student.

Send the class electronic holiday cards. This is simply you saying, “I know it’s the holiday time, class, and I just wanted to wish you a very nice one.” Again, this strengthens that all-important student-faculty rapport, adds a dash of lightness to your course, and makes your class just a bit nicer to attend. Here are some free and quite comprehensive e-card sites:

- www.riversongs.com
- <http://greetings.aol.com/index.pd>
- www.123greetings.com
- www.cirquedusoleil.com/CirqueDuSoleil/en/clubcirque/home/default.htm

Keep your tone serious yet within the holiday spirit. There should not be a dramatic shift in your tone—in emails, announcements, chat, discussion, etc.—during the holiday season, as you want the students to continue all aspects of your course in a serious manner. Yet it is the holiday season, so striking a nice balance between the usual “sound” of your writing and some holiday spirit is both appropriate and important (to help keep students engaged) during November and December.

Be more accepting of late assignments due to the holidays. The holiday season can be crazy at times: visits to and from friends and

CONTINUED ON PAGE 8 >>

<< FROM PAGE 3

educators desire—and in ways that only technologies can foster (Fogg 2003).

For example, consider a student who finds a particular section of a module difficult. Although he completed all module scenes and practice exercises, he failed related quiz questions. He knows he needs additional help from the instructor (and his instructor will know this as well). However, in tracking his scores relative to his peers, he notices that a large percentage of the class also struggled with this same content. He decides to form a study group with classmates and emails questions to his instructor. By granting students access to *their own data* and enabling them to monitor their progress, we can encourage a metacognitive approach to learning and increased contact between students and faculty—best practices in education (Bransford, Brown, and Cocking 1999; Chickering and Ehrmann 1996).

Next steps

In fall 2008, the UNC Eshelman School of Pharmacy will deploy the pharmacokinetics modules. Concurrently, TL Interactive will generate and refine prototype reports throughout the semester in an effort to better evaluate the promise and challenges of clickstream recording and analysis methodology. Based on student and instructor feedback, we hope to demonstrate the viability of Web analytics in educational research.

Conclusion

Web analytics is a recognized field in the world of IT. As more courses, materials, and learning experiences move online, there is an opportunity

and an obligation to examine the learning effectiveness of new ways of teaching. Clickstream recording and analysis is one aspect of Web analytics particularly well suited to educational research. A record of online student behavior can provide a better understanding of how students engage with online materials and what educational impact those materials are having. Furthermore, the statistics gathered can be used to generate reports for both instructors and students. By monitoring their progress, students may be motivated to engage more fully in their courses and may take an active, metacognitive approach to their learning. These are the kinds of behaviors educational institutions seek to foster in learners. Clickstream recording is a simple, appropriate means to bring these behaviors to light in the online environment.

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<< FROM PAGE 1

glimpsed a gamesmanship strategy I found fascinating: a student who earned 8 points in the first attempt and scored the maximum in the second attempt. I thought the student would have “held” with an average score of 9. But the student used the third trial to score 10 points again, raising the average to 9.33. In the second and fourth quizzes, I saw a magnification of this effect: multiple 9/10/10 patterns. Rather than holding with a 9 “A-hand,” a student decided to draw two other quiz cards to move to a 9.67, a stronger A. I also discovered a surprising problem related to judgment and sustainability: a student who scored the top score (10) three times (the second and third trials were not logical) in the first quiz accepted a 90 percent in the second quiz, forgot to take the third quiz, and finished the fourth quiz with a 6.

The final exam had been designed along a more traditional format: a onetime shot during a time limit of 90 minutes within an 11-hour window. After several polite student requests for an extended time because of multiple exams, I decided to use the same multiple-attempt format, allow an additional 30 minutes to take the exam, and lengthen the time window to 25 hours. I was pleased to find that

students who requested additional time available took the exam within the extended testing window. As for multiple final exam attempts, only three (15 percent) students took advantage of the opportunity; they earned an average improvement of 6 points (half a letter grade).

I ultimately decided to allow multiple final exam trials when my inquiry toward the end of the course showed a spread in student performance. After the final, student performance variation continued. Five (25 percent) students who tested well (scored high and/or took advantage of multiple attempts) and submitted strong individual projects (55 percent of the grade) earned top grades. Of the other 15 students, I estimate 13 (87 percent) could have earned at least a half grade higher by taking advantage of multiple test trials. I was amazed at the many missed opportunities.

With multiple trials, students did not need to have a test reset by an instructor. I finally found a method that allowed a generous test window and unleashed me from a system that sometimes malfunctioned. An interesting benefit came after the semester ended when a “grovel” email arrived from a student who requested rounding up her percentage to the next grade. In showing I was unable to replicate her higher percentage, I pointed out that of five testing situations in which she had

multiple attempts available, she had taken advantage only two times. As I looked more closely at the student’s online pattern, I found an irregularity: the student had an open final exam first attempt with scores for second and third trials. I felt comfortable indicating that the student could have earned a better grade, but there were many lost opportunities. The biggest benefit of multiple testing attempts came when the course evaluation report showed high student ratings. The goodwill generated by the security of having additional testing opportunities available was viewed positively by students.

Despite my initial skepticism, my one-course investigation of student usage and performance provides compelling evidence for applying multiple attempts to some testing situations in the future. A final exam might not be the best option in some courses, but using multiple-trial testing worked well as an instructor-pacing method. The goodwill generated was a deciding factor. Even if students decide not to take tests more than once, multiple test trials provide a learning opportunity.

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<< FROM PAGE 6

relatives ... large, festive gatherings ... special concerts or events ... loss of power and/or Internet connectivity due to snowstorms or tornadoes ... extra shopping. As a result, students may miss assignments, discussion postings, and other deadlines. Be flexible about this—you don’t want a reputation as a Scrooge!

Emphasize the link to the new year. Remind students of your course’s continuation into January—

and beyond. If your course is ending before the year is over, offer some suggestions as to how what the students have learned can help them in 2009: in their majors, in their professions, in other courses.

REMEMBER: Decorating your class for the holiday season requires the trimmings of parceled creativity, sage advice, a rosy attitude, and a tad more time—but the end result will be splendiferous.

You can always reach me at erolcraigsull@aol.com. Please forward me your computer tips and suggestions to make teaching in the online classroom more efficient and productive.

Errol Craig Sull has been teaching online courses for more than 12 years and has a national reputation in the subject, both writing and conducting workshops on it. He is currently putting the finishing touches on his next book—The Student’s Complete Guide to Online Learning. @