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**Teaching Naked:**  
***Why Removing Technology from your Classroom Will  
 Improve Student Learning (Extended article)***

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**F**lashy powerpoints with video and synchronous e-conferences are impressive, but the best reason to adopt technology in your courses is to increase and improve your naked, untechnological face-to-face interaction with students.

Technology is often accused of pushing people further apart (the interaction is really with a computer screen and not another human being, they say) but a few minutes of questions at the end of an hour covering material from behind a podium is hardly an interactive experience either. However, simple, new technologies can greatly increase your students' engagement



*outside* of the classroom and thus prepare them for real discussions (even in the very largest classes) by providing content and assessment *before* class time. The goal, in other words, is to use technology to free yourself from the need to "cover" the content in the classroom, and instead use class time to demonstrate the continued value of direct student to faculty interaction and discussion.

Most of the ideas listed here are aimed at medium or large courses (20 students and above) where lecturing remains the easy choice and powerpoint has become the most abused new technology. If we believe that the value of a residential college experience consists largely of the human interaction between professors and students, then we should maximize that experience. Better online courses are coming and consumers and legislators will continue to put money where the best learning is. Residential colleges will always be more expensive, so there should also be a demonstrable learning benefit. Technology will surely be a key component of all future higher education, but we need to rethink how we use technology inside as well as outside of the

classroom.

This article proposes why you need to learn to use technologies, but leaves the how of powerpoints or podcasts to your campus learning and technology support. My subject is the dramatic impact on student learning that can result from these simple new technologies. It will take time to get started, but you don't have to do it all at once. Another advantage of these technologies is that you can save everything: every experiment serves as the basis for another trial later.

As young teachers, almost all of us over-prepared for class with more content-specific lecture notes than we could ever deliver coherently. All of us have rushed through content at the end of a lecture and finally looked up to see everyone asleep. All of us have also had the unexpected and exquisite student epiphany that usually occurs when we abandon the script and follow our instincts or a student question. The best teaching moments do not happen when we are worried about making sure we do not forget a detail. These new technologies allow faculty to abandon this tyranny of content (at least during class time), but they will also require us to rethink our use of class time. I'll return to this at a later date, but I strongly endorse under-preparing for class; it will lead to your best teaching moments though it will feel a bit like teaching naked.

### **Use Email to Create More Class Time**

If you need to reschedule the midterm or change a reading, do not take valuable class time to make announcements that some students will copy down and most will forget. Lists of announcements are time consuming and ineffective. Email is a great way to communicate with your students and save class time for something better. Technology makes it easier to provide an email or handout with the complete details; For maximum effectiveness, limit announcements to one highlight.



There are some terrific fringe benefits. First, today's students are used to getting constant phone calls, text messages and email from friends and parents. Imagine my surprise when I first read on a student evaluation: "This professor emails me several times a week and it shows he really cares about his teaching." Student perceptions of your enthusiasm and dedication are tied to their engagement in the subject. They *like* getting email from you, and you

immediately seem more open, accessible, friendly and caring.

Second, you never again have to worry about something you forgot to say in class. Never again will you need to cut off an interesting discussion or a great off-topic question to "get back to the material." If you forget some vital information, simply email all of your students after class. Again, students like this and it reinforces what every campus has been trying to do: to connect learning with the entire college and life experience. Email is a great way to remind students that *they* are responsible for the learning and that they should still be learning even when they leave the classroom.

Third, you can guide your students' time outside of the classroom by providing timely reminders of key themes in the reading or connecting classroom topics to current events. Students always learn better when they perceive that the material is relevant and most of us see connections to our work periodically in the news. Since mentioning a recent news item might divert us away from other course content during class time, we sometimes skip it, but email is the perfect way to draw attention to a news story immediately, as it happens. A quick email about an item in the student or national newspaper relates to a current class topic is the best way to get students to connect your class with the rest of the world.

Most universities now have some sort of course management system that automatically creates emails lists for every course, but another way to reach your students is to create a Facebook site for yourself. (Go to Facebook.com and follow the instructions.) All of your students are already in this virtual community and asking them to join a class group creates a virtual community where they already live; posting an announcement on Blackboard is the equivalent of asking them to come to office hours in your building. Posting on Facebook is more like showing up in the dorms for dinner. Posting here may reach students more quickly.

### **Use Online Tests to Create More Class Time**

Online course management systems all include some testing function. Many of us have felt the conflict between a desire for more timely assessment and the problem of "losing" class time. In the last year or two the sophistication of online quizzes and assessments has dramatically changed in products like Blackboard, but there are also a quickly expanding array of free learning modules developed by your colleagues at [www.merlot.org](http://www.merlot.org).) Moving one or more assessments outside of class time, again frees up the class time for something more interesting.

Again, the fringe benefits far exceed the original goal. You can now give more quizzes and more varied assignments. You can allow (or require) students to work together. You can monitor their progress more easily. You can provide opportunities at different hours; this levels the playing field for different types of learners and situations, but also reaches the traditional students who want to study late at night. Most importantly, however, you can disguise learning as exams and tie the assessment of learning to measurable and increased learning.

As a music teacher, I used to give periodic "drop the needle" exams, where the teacher drops the needle onto the record and asks students to identify the style, period, composer, performer etc. These were easy to grade, but as class size grew so did the work, and they took up class time. They certainly didn't enhance learning; they only measured the work students had already done. Then I created simple multiple choice exams in Blackboard. This freed up class time, but students needed a way to test the system before logging on to take the exam. So I created practice exams for each week using the same questions, but with the same pool of audio examples. My support person wondered if students would cheat by memorizing all 150 examples before taking the test. I thought, "that isn't cheating, that's learning." Indeed, allowing students to "practice" (or "cheat") dramatically increased how much time they spent "studying" or practicing this activity and increased the scores on the exams by almost an entire grade. Even when I randomly moved exams back into the classroom, there was dramatically increased performance.

Peer review works in much the same way. These simple technologies also make it easier for students to share and critique their work. Peer review is useful for students in the same way it is for faculty: you need to start earlier and you worry more because you want your peers to like your work. When reading the work of others you learn about your own strengths and weaknesses, you learn sensitivity for audience and you learn new information. Peer review often turns out to be a better motivator than doing it for you, but all of this again is a fringe benefit to the core value of getting students to prepare for class.

### **Quizzes before Classes: No More Unprepared Students**

We've all arrived in class ready to discuss an interesting reading only to find that most students have not done the reading and are hiding behind their desks. One way to ensure this never happens again is to create an online mini quiz for every reading; each quiz is due an hour before the relevant class. This is very simple technology. Create four multiple-choice questions and email a reminder and a deadline to all students.

Blackboard (or your other course management software) will ensure that the exam goes away as class starts.

Again there are fringe benefits.



An earlier version of this concept is Just in Time Teaching or "JiTT." (Novak, Patterson, Gavrin and Christian, 1999)

Students prepare a problem set or an assignment in advance of class and submit it before class; you use class time only to work on the problem areas. New technology makes this easier and even more effective. Now, not only do you know that every student did at least some of the reading, you can print out the quiz results an hour before class and focus on the issue they found most confusing or most compelling.

This does not have to be an SAT reading-comprehension-type question. I often ask students to discover the bias of the writer, the hidden assumptions or to relate a story from their own life that reinforces the point the author is making. It does not even have to be a quiz. You could require your students to make an online posting, submit a question they have, or design a poster/web page to entice other students to do this reading. There have been online discussion groups for over a decade now and even in a large class, students can be divided into smaller discussion groups. (Again, if you use Facebook, you can reach students where they already live.) While there is disagreement about whether online discussion can substitute for face-to-face discussion, it is clear that forcing students to make a few postings or demonstrate some competence with the material before class can only lead to better in-class discussions.

### **The Inverted Classroom**

Most of us learned in the traditional model: come to class unprepared, listen passively to the first contact with the material, then go away to "learn" the material and then return for the exam. In an "inverted classroom," (Platt and Lage, 2000) the first contact and exams happen outside of the classroom, but students come to class prepared to engage with other learners and the professor. Project-based learning and the studio model of teaching in the arts are also expressions of the

importance of engaging with students in the flesh. Technology makes it even easier to invert your classroom so that your classroom becomes the center of learning rather than only a passive point of first contact with the material.

The traditional model was once the most efficient one. Long before the rise of cheap textbooks and the internet (in ancient Greece, for example) a lecture was the cheapest and most efficient mode of communicating new knowledge to a large group of students. Larger nineteenth and twentieth-century concert halls and most of our lecture halls were designed using the latest acoustic technology to aid this delivery of content. New technology allows for more varied modes of communication.

The same applies to meetings and the business of academic governance. Most of us no longer want to tolerate long meetings where one person simply regurgitates information from their last meeting. That used to be efficient, but with new easy forms of communication, you can send the content, the facts or the information in an email or other forms of communication and use the meeting time for discussion and exchange of ideas. We demonstrate the value of our academic missions and the human exchange of ideas when we provide the first contact with material before the meeting or the class session.

### **Lectures of Wonder**

In the nineteenth century, long before radio, movies, television or paperbacks, going out to even a poor public lecture or concert was a rare and stimulating experience, but we can hardly expect our students to be this enthusiastic. Our students understand the difference between passive and active multimedia experiences, and they are used to walking out of bad movies, concerts or lectures. So if you want to reach students through lectures, they need to be lectures of wonder; they have to be even better than they used to be to be effective at all. This is probably hard to do three days a week.

I am not advocating abandoning lectures entirely. In the same way that live music and live theatre remain totally different experiences from recorded music or film, live lectures are different from podcasts. Note, however, that the rise of recordings has had a dramatic effect on live performance; when you could only hear Beethoven live and in concert, you would tolerate lots of wrong notes. Increases in recorded music have increased not only the standards of playing on those recordings, but also in our concert halls. Thanks to recordings, we demand better acoustics and more compelling performances on stage. You only go to a concert when the live experience offers you something you can't get at

home. Most students only come to class when we force them to come. Save your best stuff for the live experience, but be realistic about what is engaging and how often you can deliver it. One or two fantastic performances a week can still engage your students.

Further, the most obvious way to open up class time for those best "aha" moments is to remove your recitation of content (the lecture) from the class room. If your classes are only lectures and exams, you might as well be teaching online. Class time is too valuable to allow students to sleep. Coming to class has to "add value" and reducing the technology and increasing the human interaction is the best way to create something interactive that cannot be duplicated online. Most of your lectures (all of the ones covering "content") can be turned into videos, but interactive discussion cannot.

A great lecture is a great performance; it is best at stimulating an interest and spreading enthusiasm for further study. Like any performance, you need wow factor, pacing (including change of pacing and plot twists) and you need a great ending. If your lecture includes a great "aha" moment, live experiments or demonstration, or you keep students on the edge of their seats, then lecture and make them even better. (Bligh, 2000) You can, however, probably improve that lecture (and that "aha" moment), by removing that survey of the bones in the foot or poetic structure. If your students need that content to understand your great moment or to engage in discussion, then communicate that in some other way. The lecture then can focus on something dramatic and memorable. Current research (Crouch and Mazur, 2001) demonstrates that students retain relatively little content from most lectures, but they do take away a lot about your attitude toward learning and your subject.

Your style of teaching conveys volumes about your values, your discipline and what you want students to learn. When you lecture about facts, the implication is that they should be memorizing facts. If you tell students that they need to question authority, but you lecture from behind the podium, it is harder for them to question you and they probably don't take you seriously. If you want students to think or consider multiple points of view, you need to create a situation in the classroom where they can do this.

The physical structure also matters. Like the medieval cathedral, the traditional lecture hall is designed to let students know who has the power. If you are not going to lecture, you probably need more flexible seating. Think too about the schedule. If you have one great lecture per week, then give it in a lecture hall and make it the performance of your life each week. The discussions, of course, work better in different architecture, but changing the mode of delivery or opening more time for

interaction probably also requires some reworking of your class schedule. (Universities are only just beginning to think about alternative classrooms. Most are focusing exclusively on "high end technology classrooms" which misses the point.) You can do discussions or projects with a larger group, but again universities need to begin planning for more flexibility of approaches. The good news is that we can make better use of the spaces we have if we do not have to lecture three days a week.

While a good lecture is still a great way to present an introduction to many subjects, there are now better ways to allow more people to see them (see below). While the technology is relatively easy and available, the much more dramatic change is what happens in the classroom. Many new pedagogies (JiTT, Inverted Classroom, or Project-Based Learning) rely on a professor who is an improviser in the classroom. This won't appeal to everyone and it is a huge change, but fear is not a good reason to avoid trying. We all entered this profession because we are passionate about our subject. All of us can talk passionately for 50 minutes (or longer) on a variety of subjects, and for most of us, reducing the lecture notes and trying only to communicate passionately a few key ideas results in more excited students who are inspired to learn more.

"Teaching naked," means moving some of the content, removing some of the personal safety net and simply trying to connect with our students. Delivering first contact with the material is very safe; you know what comes next and it is the students who are naked and unprotected. When you provide another means and incentive for learning the material in advance, you give up some control, and that can feel like teaching naked, but it can improve students learning.

### **The iPod and Handheld Technology**

Once you get to the details, most of the new pedagogies associated with the iPod, also work with other more readily available technology, but the lesson of the iPod itself is "you can't fight cool." There are other devices that do what an iPod does (in many cases more cheaply), but ultimately what matters is which device draws you to use it over and over again. The iPod is cool and easy to use; when you buy one you use it and it changes your life. That is an important lesson for all teachers.

This will not be an ad for Apple, but rather an examination of how faculty can take advantage of the current love affair with the cell phone, iPod and other hand held devices and what it means for the future of higher education. The iPod's primary function is as a portable playback device, but expect to see more convergence of handheld devices and wireless technology. If you look in a student's backpack you are likely



to find a variety of these devices.

Everyone has a cell phone and exchanging texts and pictures is automatic for today's student. If you do not already patrol your examinations carefully, be aware that no one writes on their hand anymore. Cell phones allow students to text questions and answers to each other with barely a glance into the palm of the hand. Sending a picture of a diagram or chart is almost as easy and the newest devices can hold and display loads of text, formulas, sounds and pictures, previously gathered.

While cheating is easier, so is getting instant feedback. Some textbooks now come with "clickers," an infrared device most like your TV remote, that allows students to send you instant feedback about a question. A handheld Nintendo game allows you to send a picture as well.

We can either try to force students to learn the way we did, or try and harness the energy already being expended in other ways. Information is not as essential as it once was. While your doctor probably does not have the time to explain everything about your new condition to you, you can learn more than you want to know online. In fact, some people already treat the doctor's visit like an inverted classroom, going for clarification and the personal implications only getting some first contact after searching the net! We can harness this now pre-existing skill in our students.

Lots of devices allow internet access and many students already bring laptops to take notes. What would happen if you encouraged students to find the mistakes in your lecture using the internet and gave away prizes? It is easy to check before class on what the obvious google search will turn up. If we want to teach our students that learning is more than memorizing, or finding a web site with the correct information, then we need to provide them with an opportunity to sort and evaluate the information they take for granted.

Again, there is a fringe benefit. Most of us want our students to see a problem from multiple perspectives, but students tend quickly to dissolve into a complete relativism. What better example to understand both the existence of multiple perspectives, and the *evaluation* of these perspectives, than the internet world they already inhabit?

While I see lots of possibilities for new sorts of hybrid classes, I still believe that the best use for most of this technology and for most faculty is to use it *outside* of the class room. Yes, send your students on a GPS tour of a local neighborhood, force them to collaborate on problem sets, make them record their impressions of a concert on an iPod, have them

do a photo essay of a campus rally or have them listen to a podcast, but use the classtime for other sorts of human interaction.

### **The Podcast**

Email is no longer cool. Students use it, but they spend much more time on Facebook, blogging, text messaging and with headphones. You can send a detailed 12-page email, but they will probably do what you would do: save or delete without reading. In the same way that most faculty now pay more attention to a short voice mail message or a short hard copy memo, students pay more attention to shorter text and longer audio programs. It is all a competition for attention.

Students are much more likely to spend time on their computers if they are doing something and not just reading text. A podcast seems to get more attention than the same information as text, partly because you can add other interest to the podcast both sound and video. This is true for a lecture as well; one of the reasons powerpoint has become so popular is that adding slides, sound or video, provides a break from the stream of words. There are a number of different ways of creating web/iPod versions of your lectures: you can add the audio directly on top of your powerpoint, or start with audio files and everything in between. The end products can be played via a web site or loaded onto an iPod or other portable device.

Podcasting simply means that you release the files one at a time (weekly, for example) with embedded instructions for them to be loaded directly onto a portable device like an iPod. It is like a magazine subscription; the next issue comes automatically. There is some advantage to this, not the least of which is the "coolness" factor for students, but this wears off and not everyone has an iPod. It is equally easy to simply post the files weekly to a course site.

Podcasts can be anything from little audio notes instead of email (there is a test next Wednesday, please study) to a substitute for lectures. They are an especially good way to follow up an example of something that came up in a traditional lecture. They are most effective when they include an audio or video clip, an excerpt from a speech, music or a powerpoint animation (of a process or mathematical proof). The web sites of the Library of Congress and the National Archives are loaded with interesting sounds and Google Image can supply an astonishing range of pictures for all disciplines.

Podcasts really just supply another access to the content of your course. At present most students either read the book or go to lectures (unless

you have found the secret formula to get them to do both). Podcasts allow more types of access, but a very nice feature of podcasts is that students can skip ahead or go back. Most of us rely on students to hit the back button in lectures by raising a hand, but they rarely do. Further, in a podcast, you can cover more material in more depth than you ever would in class. This is partly because you have infinite time and partly because you know students can skip ahead to the next section when they "get" the current one. This works a bit like the "further reading" assignments that no one does anymore. Still, it can be enormously liberating in the class room to know that you can simply refer students to your favorite example about the misuse of the pythagorean theorem.

### **Serious Games**

Video game designers did not set out to create an educational tool. They set out to create products that people would buy. Players want games to be easy to learn, but not short or easy to play. Good video games are challenging, long, hard, complicated and engage the player in active learning. Good video games do everything that we want good learning to do (Gee, 2003):

- ◆ **Risk Taking:** Good games lower the consequences of failure.
- ◆ **Customization:** Good games allow lots of different types of learners to play.
- ◆ **Pleasantly Frustrating:** Engaged learning is challenging, but doable.
- ◆ **Interaction :** Plato complained that books are passive and can't talk back.
- ◆ **Production:** Learners are not just consumers, they are writers and creators.
- ◆ **Agency:** Learners want to feel a sense of control
- ◆ **Challenge and Consolidation:** You only become an expert by mastery. Games encourage learners to explore thoroughly before moving on.
- ◆ **Situated Meanings:** People learn better in contexts.
- ◆ **System Thinking:** Games require learners to think about relationships.
- ◆ **Lateral Thinking:** Learning requires rethinking goals periodically
- ◆ **Performance Before Competence:** Everyone advocates learning by

doing (and that is how we learn language, but most schools are set up in the opposite way).

Video games can be all sorts of things, but mostly they are an attempt to design an assessment that is both learning and assessment. After turning my "drop the needle" exams into "click on the file" exams and creating practice exams, the next iteration was to make the entire process an engaging game. While I now use a slightly more playful interface (you use your arrow button instead of selecting a letter in a multiple choice exam) mostly it is the idea that this is a game instead of an exam that is powerful. Instead of administering an exam every week for ten weeks, there are ten levels of the game. Students control their own progress and learning and accumulate points toward the final grade (one for each level). Now students must master each level before moving on. (Bowen, 2005)

In the exam model, you can only force mastery in a punitive model: learn or fail. With a game the idea of mastery and increasing levels of difficulty is built in. In fact, one of the greatest reasons for starting work on a game, is that it will force you to clarify exactly what you want students to learn and when.

Almost every campus now offers some assistance with educational technology. You don't need to know your flash from your mp3 to create a game; you simply need the sympathetic ear of someone in the technology lab or a little money for a student helper. Many of us are very creative when it comes to pushing the boundaries of our discipline, but pushing the paradigms for learning is equally creative and perhaps even more important work.

### **Learning Modules**

Learning modules sounds more professional than video games, but, in fact, learning modules are a collection of activities for students with defined learning outcomes. [Merlot.org](http://Merlot.org) offers a huge range of learning materials other faculty have already invented and are willing to share for free.

Learning modules is a broader term, however, and we have all been using these since we started teaching. While often thought of as an online device, at its simplest, a learning module is a unit of content. To transform a unit into a learning module, start by creating specific learning objectives for the unit. Some of these learning outcomes may be best suited to online learning or evaluation; some learning modules are no more than a collection of text-based web pages and an exam. But even a simple learning module like this can transform what you do in the

classroom. If students must complete a learning module before they arrive in class, other possibilities open in class. If you can accomplish all of your learning outcomes this way you either already have an online course or you need to rethink what you want your students to learn in the classroom.

If you teach a common subject, you may never have to develop your own learning modules; a quick [Google](#) search or [Merlot](#) search will tell what other faculty have already created. The best materials are already being copied and reused in a variety of new contexts. This is not unlike what happened with the spread of textbooks. Few of us slavishly design our courses around existing textbooks. Most of us, however, continue to assign textbooks to help us "cover" the material, even when we radically disagree with the perspective or content chosen. Online learning modules work the same way. What will make your course unique, is what happens in your live interaction with students. Learning modules are simply the new textbooks.

### **The Real Problem**

Another fringe benefit of all of these techniques is that they are efficient; classes can get a little larger without losing quality. But how large is large? Once class size grows beyond 25 or 30, most of us start to change techniques. While what you have time to grade changes, a lecture to 60 or 400 students is usually still a lecture. When I taught 60 students at a time in this format, 33% thought the class was too large. For the last two years I have taught more than 200 students in the same way, but still only 33% think the class is too large. Most of these techniques have the effect of making the class seem smaller than it is.

The goal of all of these technologies should be to spend more time interacting with your students. So don't get caught up in the "production value" of your podcasts, email or other communications. Remember how your writing changed when you first learned to use a word processor? You can always edit these communications next semester. Save everything. But none of this takes the place of teaching. If you remember that your real goal is to interact with your students, you won't get hung up on the technology.

The bigger problem is what to do with all of the extra class time. One easy option is simply to eliminate the large lecture class time altogether: use the extra time to meet in smaller groups with your students for discussion. But even in larger groups, there are more interactive things you can do.

Students learn best when they are doing. They learn more when they are

engaged and learning for a purpose. Everything in the literature on pedagogy and how students learn supports using technology outside of the classroom as a way to deliver content. This leaves you free to interact with your students and do all of the other things that are clear from research on pedagogy: provide positive feedback, problematize learning and the discipline itself, encourage them to take risks, interact with each other, generate enthusiasm for the subject, give them a sense of control, think instead of memorize, ask them to be more self critical and to take learning seriously. These are all of the things we have complained about for years, but were too controlled by content and didn't have the time to cover them.

Technologies greatest gift is to release you from the tyranny of content. There is time for everything now. The real problem is that this now leaves you standing naked in front of your class wondering what will happen next. That is also the moment when the most real learning can take place. Be afraid, but take the risk.

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#### Web Sites

Facebook: <http://facebook.com>  
 Learning Modules: <http://www.merlot.org>  
 Peer Review Writing: <http://depts.washington.edu/pswrite/peerrev.html> or  
<http://www.mwp.hawaii.edu/resources/wm7.htm>  
 Podcasts: <http://www.apple.com/itunes/podcasts/>  
 Serious Games: <http://www.darfurisdying.com>  
 Talking Powerpoints (audiotours) and Jazz Video Games: <http://www.josebowen.com>

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