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**Tomorrow's Teaching and Learning**

-------------------------- 1,923 words -------------------------

**Timeslicing in the Classroom**

The classroom is going through a time of extreme change and transformation. It is interesting to observe the habits of the students during lectures. Many, particularly returning or older students, still take notes with pencil and paper. Others have preprinted PowerPoint slides downloaded from virtual learning environments and are highlighting those in class. Still others are using their laptops or, as in some of my classrooms, the university-owned desktop computers to annotate the slides during the lecture. Then there are the truly digitally inclined students. Several of them type notes directly into their email, instant messenger or Facebook account. One student even told me he was Twittering my lecture on a mobile device so he and his friends could review the notes later. I've asked my students who Facebook, Twitter, or IM the lectures about their habits. Some say they send the material to classmates they know. Others say they post the material to websites or social networking walls that have been created for the class. One student uses a virtual flashcard software package to take that day's lecture material and transform it into a study aid. He makes it available to anyone who wants to see it and says students from other universities using the same textbook have worked with him to create decks of flashcards and other study material of their own initiative.

The tech-savvy millennials have begun to bring their "toys" to the classroom as tools. Currently, I experiment with permitting cell phones and smart devices in my classes. I ask students not to talk/social network on personal matters but to use the technology as a data input device for notes or recording class information. Some students take photos of images projected on the screen in class. My goal is to instill appropriate mobile-technology behaviors because they will be using these devices in their professional careers. As a teacher, should I be alarmed about their desire to stay connected? Quite the opposite, I believe. Information used to be my own private asset. That is no longer true. I knew the material, where to get it, and how to parcel it out to enable a fair and equitable exam that would motivate students to read, study, and hopefully learn. Now, instead, information is available to anyone that cares to use it. This is a good thing. No—a great thing! It will ultimately free everyone to make better use of their time and progress more rapidly. In addition to the methods of taking notes I've already mentioned, I've also observed the following in my classroom:

**Video Recording:** Students use cell phone cameras, digital cameras, webcams on their laptops, and even small video recorders to capture the lecture and post it on the Web or email it to a classmate who is not in class. Some students ask permission, and others just turn on their video-recording device and do it. This practice makes a professor want to be sure the lecture is accurate and articulate. That recording could be around for a long time. Some professors have posted policies about video recording to describe what is appropriate and what is not. Although none of my lectures (to my knowledge) have been posted to YouTube or another video-sharing site, I have heard from colleagues that this is happening.

**Audio Recordings and Podcasts:** It is much easier to create an audio track of a lecture than a video. Although this may not be too effective in some courses, in others it works fine. The idea of audio recording has been around for a long time. I remember in my undergraduate years receiving a tiny tape recorder from my parents as a gift and then using it to record complicated lectures for which note-taking was difficult. I would listen to certain parts of the lecture a couple of times until it made more sense. That same technique is being used today with one major difference: Once a digital recording is made it can be copied, emailed, posted, distributed, podcasted, and so forth. I am not so vain as to believe that's what happens to my lectures, but once in existence, the digital artifact takes on an existence of its own completely out of the professor's control.

A variety of **Web 2.0** tools are being used by students for note taking and classroom enhancement. Details of these technologies and ideas for formalizing their use in teaching will be covered in chapters 4 and 5. Brief examples of student-initiated uses follow.

**Wikis:** I have noticed two types of student-initiated wikis emerging recently. One is a space made available by teachers. Students are invited to contribute their notes as shared content in productive ways. Generally, these wikis are "reset" at the end of a semester so the next group of students can enjoy the same learning benefits as the previous one. A few wikis using this model are more persistent, and subsequent classes start with the existing material and continue upgrading and improving it. Students add to the wiki during or after class using laptops, mobile devices, or other computing platforms.

The second type of wiki is fully student created. It usually persists beyond the semester. These wikis are often oriented toward important information for exams and may provide answers for chapter end questions. Wikis such as these often are maintained by student organizations (e.g., sororities or fraternities). In my opinion, these wikis will eventually become larger and more interconnected. Students from all around the world can add material based on class subject, textbook, or other attribute to engage in global learning and information-exchange experiences.

**Blogs**: Several students blog their classroom notes, but this lacks the power of community development The students who blog report they use it as a tool of convenience and to avoid losing notes if their computer crashes or they misplace their USB drive.

**Twitter** (Microblogging): When smart mobile devices are permitted in class, Twitter and microblogging becomes a viable tool. Students can text small messages about class content, important concepts, reminders, and other material to themselves. Twitter can also permit students to organize and interact with classmates who share their tweets with one another. A historical record of their tweets becomes available on the Web and can be used as a basis for studying or creating a more detailed set of notes later. Several of my students tell me that Twittering during class has improved their ability to recall important concepts and gives them a huge advantage when it comes to studying.

**Social Networking**: It almost goes without saying that today's tech-savvy millennial uses social networking as an education enhancement tool. I have students Facebooking in class every day. Once during my lecture, I used my laptop to send messages to a couple of students I knew were on Facebook. I watched their expressions change and sheepish smiles creep across their feces. Did they stop Facebooking? Of course not. They were using it to jointly take notes and create a record of the class lecture. At the same time they were chatting. In the true timeslicing sense of a tech-savvy millennial, they were also posting comments, humorous in their minds I'm sure, and browsing through a couple of websites, reading up on the upcoming K-State football game.

I frequently see my daughter doing homework while communicating with her friends who are logged in to Facebook. Is this bad? Something we should stop? Of course not. They are learning in teams in a cooperative way. This is what we've been trying to teach, but without such a useful tool. Leave it to them to learn on their own, especially because networking has become truly useful, beneficial, and fun.

**Cell Phones and Smart Mobile Devices**: In the survey I hand out to tech-savvy millennials during my high school talks, one finding remains constant: the universal love of cell phones and smart mobile devices. One question asks which technology they would be unable to survive without. In my youth, it was television. Then, over time, video games (like Nintendo 64) gained favor, giving way to computers with Internet access. Now, overwhelmingly, 90 + percent of student respondents cite smart mobile devices as the technology that makes their lives worth living! They are the ultimate timeslicer's tool. Many tech-savvy millennials consider text messaging, Internet, music, digital imaging, voice, and video all as integral and natural parts of their mobile devices.

After giving the survey, I often ask the students why they can't live without smart mobile devices but can live without the Internet. One student in the back yelled out: "My phone is the Internet so I don't need it separately." The others murmured in agreement. It wasn't the point I was trying to make, but it illuminated the topic. The tech-savvy millennial doesn't necessarily see a dividing point between their mobile phone, digital networks, and themselves. The student feels part of the system, a node on the network. So for a timeslicer, a mobile device provides the ability to walk, talk, listen to music, snap photos, and text a friend at nearly the same time. This tool, which I still fumble with, has become the symbol of a generation, and anytime a teacher takes them "offline" and makes them shut off their mobile devices, these students feel stressed. Mobile devices are data-entry tools for the tech-savvy millennial and are the key interface point that makes them a node on the Web.

**Instant Messaging and Texting:** A quick and dirty, less persistent social networking application, students often use IM as a computer-mediated communication technique that enables classroom note taking. IM uses laptops and computers as a platform. Texting is the same thing done with mobile devices. You can imagine all the possibilities this technology enables. On the simplest level, answers to in-class problems can be exchanged. This, of course, is not how a teacher hopes students will use their capabilities. Taking it one step further, if homework or in-class assignments are being completed, students may compare their results and explore why certain answers differ. In a sense, this helps them understand where they went wrong and how to fix their errors. Along these same lines, I have seen students photograph solutions to math problems and then share the documents using IM software. In an ideal world, students would work together to take lecture notes and then cooperatively solve in-class problems to understand concepts.

**Live Streaming:** One period, I had an international student in class position a small Webcam on her desk and point it toward me as I lectured. Afterward, I approached her, assuming she had digitally recorded the lecture for later use. There was no recording, she said. Instead the entire lecture had been streamed out through a website called Stickam.com. A friend of hers was traveling and unable to attend class that day but had watched it remotely through Stickam's live broadcasting capabilities.

**Tablet Devices**: The release of Apple's iPad tablet device impacted the classroom almost immediately. It makes functions performed on smart mobile devices easier with a larger screen and smoother interface. Wikis, blogs, IM, and social networking all become more manageable. Students use tablets to view class material posted in VLEs or on websites. Electronic textbooks can be accessed and annotated during class on these devices. Podcasts can be obtained easily from iTunes University. Students are able to take better notes and store, email, or microblog these out to themselves and their friends. In many ways, this class of devices may become the unifying educational platform for our students.

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