Student engagement is perhaps the key element for almost any learning context. When engaged, learners are enthusiastic and excited about the subject. Their work is informed by the enjoyment of discovery. Engaged learners work willingly, instead of by coercion, and approach...
their assignments as something that matters to them personally. The spirit engendered by engaged learners in a course is infectious, spreading among and sustaining all participants.

It follows that devising techniques, supported by technology, to capture, retain, and sustain student engagement should be at the forefront of course design. In doing so, instructors and course designers need to ask themselves several questions:

- How can we garner students' interest in the subject matter at the outset?
- How can we engage the students both in and out of the classroom?
- How can we engage students more directly with the subject, with each other, and with the faculty?
- How can the effectiveness of these techniques be evaluated and assessed?

One way to begin to answer these questions is to study reports from those practitioners who are actively devising methods, supported by IT-based tools, to gain and then sustain student engagement. EDUCAUSE Review asked five such practitioners—Mark Auslander, Kelly Gredone, David Green, Bruce Hull, and Walt Jacobs—to share their experiences. Below, these faculty, from various academic disciplines, explain why they are using technology and innovative pedagogical methods in their courses and describe how these tools and methods are making their students' learning experiences richer and more meaningful.
When I began teaching at Emory University’s Oxford College in 1999–2000, my colleague Alan Cattier (now director of academic technology services at Emory) challenged me to think about ways in which new technologies might deepen students’ involvement with their immediate social and natural environments. 

At the time, my freshman and sophomore students were deeply engaged with a crisis involving the cemetery in the local town of Oxford, Georgia. A decade earlier, much of the historic African American section of the burial ground, including graves of many people born in slavery times, had been plowed under by a pulpwood merchant during a clear-cut of the trees. For elderly local women, who had guided their families to old grave sites based on the location of venerable oaks and pines, the loss was devastating.

As my students and I joined local African American congregations each weekend to repair the erosion and clear foliage in the cemetery, we also undertook to document the locations of the old graves, in many cases depending on the memories of elderly women. We developed a class website recording burial sites (http://www.marial.emory.edu/exhibitions/cemetery/Titlep.html). A decade later, the website looks painfully archaic, but it is still extensively accessed by Oxford descendants, near and far, when they prepare to visit the cemetery. For my students, the process of research and building this and related online sites—including a virtual exhibition on the early African American history of Emory University (http://www.marial.emory.edu/exhibitions/dream/index.html)—was deeply moving and intellectually exciting. No longer were they producing academic work solely for their professor; rather, they felt ethically responsible to members of the wider community, people with whom they had labored side by side in the cemetery on Saturday mornings. One student explained: “In class we have read postmodern geographers claim that the web is all about ‘deterritorialization’ and the erasure of the local. But we have discovered that the Internet can be intensely local and can help bring us and our partners back to being attentive to the importance of actual places in our lives.”

I now teach at Brandeis University in Waltham, Massachusetts, where we often use new media technologies in our community partnerships. In my “Museums and Public Memory” course, we partnered with the Boston-area southern Sudanese community and the Sudanese Education Fund to create a virtual museum of paintings by refugees in Kakuma Refugee Camp in northern Kenya (http://www.brandeis.edu/projects/sudan_center/kakuma_exhibit/paintings.html). The students recorded and edited local Sudanese commentaries on the paintings, which they came to understand as the painted equivalent of ceremonial songs, with the refugees giving voice and new life to many of their comrades who had not survived the genocide associated with the Sudanese civil war. Navigating the site, one of our Sudanese community partners reflected: “When I look at this site, I can remember the tastes, the tex-
tures of the village of my childhood. I feel this is a kind of bridge, between this place here and that place there. “Many of my students, fascinated by this commentary, wrote in their final essays about the unexpected ways in which the site activated what the philosopher Walter Benjamin long ago termed “the optical unconscious.”

Last fall, my “Cross Cultural Art and Aesthetics” class partnered with more than thirty new immigrant adult women studying at the Waltham Family School (WFS) to create an interactive, cellphone-based tour of the university’s modern and contemporary art museum, the Rose (http://culturalproduction.wikispaces.com/Rose_Cell_Tour). Initially, each of the students recorded and edited a three-minute commentary on a work of art from the museum’s permanent collection, which the university Board of Trustees was considering selling off. Some segments were scholarly, others mischievous (for instance, in segment #30, on Roy Lichtenstein’s 1962 pop masterpiece *Forget It! Forget Me!* the painting’s characters hilariously debate the merits of being auctioned off). The exercise of composing a cellphone tour impelled my students to engage thoughtfully and rigorously with major artworks: many spent extended periods looking at the works—until a lightbulb clicked, as it were. In all cases, they figured out novel ways to communicate their excitement to the listeners. Their excitement had grown as we worked with the WFS immigrant women, most of whom had never been to a museum before. The women came up with marvelous original commentaries, which were the basis of the recorded segments in English, Spanish, Haitian Creole, Laotian, and Cantonese. As one community woman remarked during our debriefing session at the museum: “When we started, I thought the museum was the most intimidating place in the world and I was disturbed by these strange works of art. . . . But now that we can hear our voices on the phone and on the Internet, I feel like this is our place.

And I feel like those strange paintings have become our friends. I can’t wait to introduce my children and my husband to them.” Once again, new media technologies had helped to deepen the social bonds between campus and community and had helped us rediscover the power of place and emplacement in our lives.

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Immersing Students in the Learning Process

Using Technology as a Tool to Facilitate Engagement

Just as happened with pocket calculators thirty or so years ago, the question surrounding technology in the classroom today is not whether or not to integrate it but, rather, how to use it intelligently to support as many students as possible. The notion of integrating efforts in the classroom with technology—the general field of practical know-how and tool use—is fueled by the reality that students need to be literate in multimedia because technology has expanded the way people communicate. The real questions are: What types of multimedia should be utilized, and how efficiently can they be implemented to engage students and support the learning in a face-to-face, hybrid, and/or totally online course?

It’s all about choices and variety. What technologies should be used? What technologies should students be immersed in to support their own learning? What variety of assignments, including alternative assignments, should be provided? What kinds of content should be offered to students with respect to the subject matter? How can students create their own content in a variety of ways? All of these choices and their varieties are evolving—hence the need to constantly evaluate and change them along the way.

My choice of pedagogical methods is grounded in the use of a variety of technology tools and techniques that encourage a multimedia literacy in which students can communicate using text, audio, graphics, animation, video, and other interactive content forms. This skill is vital for students to survive in the 21st century. It’s really all about giving students the tools to teach themselves.

Modeling the behavior seems to encourage the use of technology tools and techniques. I use a variety of free Web 2.0 tools when facilitating the learning in my classes. For example, multiple learning styles are accommodated by providing students with audio, visual, and text-based announcements, assignments, and feedback. I frequently use Screencr and Ustream to accomplish this. For the most part, I utilize free remixable textbooks that are available online. In these cases, students can choose to read
the book for free online or buy a black-and-white copy, a color copy, or an audio file at an affordable price. The choice is theirs!

Offering alternative assignments for students accommodates the variety of learning curves that exist when utilizing technology tools. For example, students might have the choice to write a traditional paper or to create an online interactive poster using Glogster or to produce a video mashup or to maintain a blog. “Death by PowerPoint” is prevented by using alternative presentation tools such as Prezi or SlideRocket.

In this environment, the traditional lecture classroom is replaced by one that supports an interactive approach in which students have little choice but to participate. Engagement, then, becomes inherent in the classroom, using a variety of techniques. A learning management system can be used in all classroom venues to manage the logistics efficiently. I require that all assignments, whether in a face-to-face or online class, be submitted through our learning management system. This mandate again encourages technology use—for a reason. Additionally, most if not all of my face-to-face classes are held in computer labs. Students are encouraged to use the multiple resources available on their computers or smartphones to “look up” questions that are posed in class. The tools are available; why not use them?

Evolving technologies fuel many of my efforts, but not all of them. Traditional memory/timed tests are replaced with assignments that ask students to find a current article, video, or image that relates in some way to the content we are reviewing. In this assignment, their mission is to convince me that it reinforces or discounts the materials. Another “test” involves group collaboration. Students are left unsupervised in their classroom to figure out how to complete a test within a specified period of time utilizing any or all of the resources available to them in an efficient way. Students learn from each other in this exercise and discover how to capitalize on their classmates’ different skill sets.

Overall, I’ve found students very receptive to the variety of techniques and technology tools. Technology, if integrated into the classroom, can engage students and facilitate the learning process.

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Gadgets, Tweets, Education, and Fun

Incorporating Emerging Technologies in Today’s STEM Education Classroom

By David Green

It seems like every time I step outside, I am smacked across the head with a new technological advance. My laptop has been outdated for at least five years. Until recently, I didn't even own an iPod. I still use e-mail, but the “younger folks”—students, for instance—say that texting is much faster and is the preferred method of communication these days: e-mail is just too slow and awkward. Texting? My fingers must be too large because I can't use my little cellphone keyboard to actually type a message.

But this doesn't mean I don't pay attention to my technological surroundings. I am well aware of the incredible ease of information and idea-sharing that occurs now because of the fantastically cool portable devices, like the iPhone. I am also aware that many students are more concerned with the latest PlayStation game than they are about getting outside and playing with odonates in the sediments of our local marshes. So what is an instructor of environmental biology supposed to do? Well, I decided to leave my comfort zone of knowing just enough to get by and, yes, to jump in headfirst and learn about the new gadgets. I am making it a point to employ, as a teaching tool in the classroom, the same devices my students are using for their entertainment. This summary explains several varieties of the emerging technologies that I am currently implementing and testing in environmental science courses for nonmajors.

My primary objectives are (1) to enhance the educational experiences for general education students by engaging in highly interactive web-based techniques, (2) to illustrate that entertainment gadgets have strong pedagogical benefits both in and out of the STEM education classroom, and (3) to gather baseline data related to the adoption of emergent technologies by students and document improved academic successes. My syllabus is largely activity-based. My students are engaged in active learning techniques, like hands-on field data collection labs, campus nature tours, and off-campus field trips to regional sites displaying the amazing assortment of Southwest Florida natural habitats. These sorts of activities leave little time for me to regurgitate the textbook to students in a formal, lecture-type atmosphere.

Podcasts. Instead of being able to listen to me only in the classroom once a week with their eyes closed as they nod off in sheer boredom, students now have access to my lectures outside of the classroom and can listen to my stimulating discussions about human impacts on the local environment anywhere they choose. They could potentially hike into a pineland, curl-up in a cozy spot, and be “one” with the very habitat I am talking...
Adobe Captivate and Adobe eLearning Suite software packages take an ordinary PowerPoint presentation and yield high-quality RLOs. Highly interactive audio lectures include animated figures, text, pictures, and illustrations. Assessment tools, quizzes, and supplementary material are combined in one easy-to-use package. Instructor’s guides for each learning module can be shared with digital repositories, like the Orange Grove (http://www.theorangegrove.org), which is part of the Florida Distance Learning Consortium. RLOs can be converted to Flash format, which allows for easy upload to the online teaching and learning platforms such as Blackboard. A table of contents allows for quick and easy navigation from topic to topic.

Twitter. A social networking system, Twitter is designed for quick comments and interactions. Many smartphones are capable of accessing Twitter accounts, giving students access to potential course discussions anywhere, anytime, and anyplace. I typically send a discussion “tweet” each week, read and summarize students’ responses, and begin the following class with a thirty-minute group discussion in which I incorporate the students’ responses (Table 2).

In summary, I have found that providing these e-learning opportunities results in a fun and interactive classroom while simultaneously providing the students with the tools they need to succeed academically. An additional bonus is that doing so allows me to experiment with new teaching techniques that help keep my style fresh.
“Nature and American Values” is a popular course, one required of Virginia Tech students in many majors. Its purpose is to equip students with scientific, ethical, historical, and philosophical tools to examine, take positions on, and engage in public debates about historical and contemporary issues affecting sustainability. Digital education technologies were recently integrated into the class with the purposes of (1) increasing student-centered learning, (2) facilitating interaction in a large-enrollment course, (3) sharpening critical thinking and communication skills, (4) reaching and affecting a wider audience beyond the professor and classmates, (5) providing students with 21st-century media skills through active and engaged learning, and (6) doubling enrollment to 130 students each semester. These innovations include student-developed websites using the wiki-based website on WetPaint (the class website can be found at <http://natureamericanvalues.wetpaint.com/>), asynchronous communication outside of class, Twitter feeds during class, and student-developed video podcasts.

Much of the course is devoted to analyzing complex contemporary socio-environmental challenges (such as climate change, energy policy, food systems, and land use). Assignments are designed to help students understand the challenge as well as learn to engage one another in a constructive debate of possible solutions. Student teams use the wikis on WetPaint to develop and present arguments for positions they define and defend. An online debate with dueling webpages occurs before a live debate takes place in class. Outside of class time, other students in the class review the arguments posted online and post critiques of the analyses in discussion forums linked to the debate teams’ webpages, with the critiques accessible to the debate teams and to other students. The debate topics are controversial, and the critiques can be incisive.

On the day the topic is to be debated in class, students arrive prepared to engage the topic and each other. Class discussion is dynamic and moderated by the instructor. There is never enough time for all the questions and issues to be discussed, so we use Twitter to help the bashful students voice their positions and to facilitate more interaction than class time allows. Students can tweet their thoughts using computers or phones. These comments are projected to screens at the front of class for others to read and respond to. These tweets are available after the conclusion of the debates, allowing the debate teams to reflect on classmates’ opinions and giving the instructor opportunities to respond to recurring themes, oppositional questions, and more. (Note: in future classes, Twitter will be replaced with a WetPaint discussion board that serves the same purpose but is more flexible, accessible, and easily managed.)

Other student teams are assigned a defined class topic and are required to develop a short video (three to four minutes in length) illustrating this topic using stories and examples of their choosing. The intent of this assignment
is to use the power of story and narrative to deepen students’ understanding of class content. There is no limit on creativity. A detailed grading rubric helps students focus their energies. As part of developing a video, teams must research their topic and develop a rationale for their production strategy. This background research and rationale must be presented on the team’s webpage (part of the course website), along with the finished video. Other students in the class are required to engage the content by reviewing and critiquing at least three student-produced videos. They visit the team’s webpage, read the research material and rationale, view the video, and post a review for the team and others to see. The highest-rated videos are shown at the end of the semester during an in-class “film festival.” Students also produced videos summarizing the class [see <http://www.youtube.com/watch?v=Jkow_6AYKqY&feature=player_embedded> and <http://www.youtube.com/watch?v=TCZjDXiNUOQ&feature=player_embedded>].

This approach has significant but manageable costs. In my case, I was insufficiently technologically savvy to independently implement these innovations. Integrating the technology into the class required a tech-savvy teaching assistant and support from the Virginia Tech Innovation Space, directed by Jennifer Sparrow, who organized a Faculty Learning Community to assist professors with this sort of course redesign. Ultimately, the inspiration and capabilities of the Innovation Space made possible both the class revision and the student video projects, which are supported each semester by Innovation Space equipment and staff.

In pre- and post-course surveys, students infrequently mentioned the technological innovations as barriers to their engagement or success. The surveys, the videos, and informal interviews all suggest that the technological innovations have succeeded in motivating students’ interaction with the material and with other students.

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Using Technology to Open Doors

By Walt Jacobs

In a University of Minnesota College of Liberal Arts online spotlight on teaching, I’m deemed to be “The Open-Door Storyteller.” The article notes: “One of Jacobs’ goals is to teach his students media literacy—analyzing critically what they read, hear, and see—without reducing their enjoyment of the media. He encourages his students to learn how to tell their own stories as a way of influencing how the media in turn portrays them.” Technology has been a key part of this process ever since I first stepped into the classroom as an instructor in my third year of graduate school, in 1995. I’ll still be using technology in the classroom when I retire, around 2035...

In my first class—Sociology S335 “Race and Ethnic Relations”—I used a desktop client course management system from AltaVista. Most students accessed the system from campus computer labs instead of downloading the software to their computers. Each week, students answered a question I posted in the “Debate House,” using course concepts and engaging the responses of others. (Each student had to answer the question, use a course concept in the answer, summarize another student’s answer, and discuss why he or she agreed or disagreed with the other student; the first student to respond had to include only the first two components.) Students also posted five items (in five different weeks) in the “Coffee House.” Whereas students had a standard format in the Debate House, they could do whatever they wanted in the Coffee House, as long as topics were related to the course in some way. I’ve found that using the Debate and Coffee Houses creates a great idea-sharing venue for students, especially those who are uncomfortable sharing their ideas in front of large groups. Indeed, some of the shy students who rarely speak in class share the most eloquent analyses in the “Electronic Classroom” (EC), and some become more outspoken in class after receiving affirmation from their peers online.

I retained the EC as I’ve migrated over the years to web-based course management systems (AltaVista for the web at Indiana University; WebCT/WebVista and Moodle at the University of Minnesota). The technology I’ve used in face-to-face class sessions has also evolved, of course: from the VHS tapes and CDs of the 1990s to the YouTube videos and MP3s of today. In my classes we start with texts that I select, but I also encourage students to bring in their own material to discuss. For example, one of the best discussions we had in a 2007 freshman seminar on black TV comedians was about an episode of The Cosby Show...
lected by a student. Students very much appreciate opportunities to be teachers who can influence the learning of others; it’s now easy for them to bring in a DVD or URL to do this. I’ll additionally note that the 2007 freshman seminar class became very engaged when I joined Facebook—after I had asked the students to explain and compare social networking systems for me. Students’ expertise in technology can be productively affirmed in small ways like this.

Throughout most of my career I’ve used course management systems and in-class technology to help students become more critical consumers of the media. My new focus is on how students can also become powerful producers of media content. I recently published an article and digital story on “digital storytelling” in the online journal Seminar.net (http://www.seminar.net/index.php/home/75-current-issue/145-the-pedagogy-of-digital-storytelling-in-the-college-classroom). The article focuses on how undergraduate students can be taught to make online videos that employ still and moving images, voice-over narration, and music to explore a variety of issues that are important to them. Perhaps even more powerfully, students who learn to make digital stories for class credit go on to use them in other situations. My former students have made digital stories as birthday presents for their parents, have become teaching assistants in other digital storytelling classes, have created digital stories to satisfy requirements in traditional courses, and have produced digital stories about their study-abroad experiences. And those were students who entered my class with no previous video-production experience! Students who did have prior production experience reported that specific training in digital storytelling deepened their ability to dive into the nuances of experiences they wanted to share in other media production formats.

In all of my classes, technology has been crucial in repurposing the classroom: the EC helps students make valuable contributions outside of the physical classroom environment; inside the classroom, media technologies help me and the students expand our community to allow for a wider range of learning opportunities. I’ve used various technologies in the fifteen years I’ve devoted to this effort, and I can hardly wait to see what’s next!

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Students are more engaged when they are knowledge creators, in addition to being knowledge receivers. We learn best by listening, critiquing, and doing. This theme is very pronounced in the cases related by Professors Jacobs and Auslander. Auslander had his students build websites and online resources for use by a wider audience, and Jacobs encouraged his students to “tell their own stories” and to bring in their own material to discuss in class. Jacobs summarizes this point when he notes that he seeks to move students beyond being critical consumers of media to becoming “powerful producers of media content.” Green makes this point as well: he explains that an objective of his course design is to enhance the educational experience of students “by engaging in highly interactive web-based techniques.”

Students are more engaged when there is a feeling of producing work for a wider audience. In traditional, transmission-based learning modes, students generally compose their work for a very small audience: the class instructor and sometimes the teaching assistants. By contrast, in these cases, students’ work is reviewed and critiqued by peers and, in the case of Auslander, produced for members of the local community. This contributes to a sense that the work matters, that it is visible to a wider audience, and that something is at stake beyond the grade. Auslander’s students could see directly the contribution their work had made. We might call this “open” coursework, and as these cases demonstrate, it can help foster student engagement.

Students are more engaged when there is selective use of the formal and the informal. Jacobs’s use of both the “Debate House” and the “Coffee House” is striking. Both are vehicles for engaging the students in discussions of the course material, but the two are designed very differently. The Debate House had a very deliberate structure and method, whereas in the Coffee House, students “could do whatever they wanted . . . as long as topics were related to the course in some way.” Both venues are effective, even when they are conducted side by side in the same course. Hull describes a very deliberate class-debate structure, with “dueling webpages” constructed before the class session. Although this was a more formal, structured venue, students participated in an engaged manner. The cases also make clear that debate and even controversy, if managed constructively, can stimulate interest and engagement, with clear and active exchanges in a variety of venues.

Students are more engaged when there is a variety of alternative venues for expression. These cases show that it is important to...
achieve widespread engagement across all class participants so that each student can find his or her voice and thereby address the assignment with confidence. This was clear from Jacobs’s case: by providing a variety of ways for students to participate in class discussion, even shy students had a means of articulating their views. Indeed, Jacobs notes that of those more reluctant to speak in front of others, “some become more outspoken in class after receiving affirmation from their peers online.” Hull tells of using Twitter for a twofold purpose: “to help the bashful students voice their positions and to facilitate more student interaction than class time allows.” Once students find their “class voice,” they can be confident participants, with greater engagement as a result.

Students are more engaged when it is clear that what they learn will serve them elsewhere and is transferable to other contexts. A student will be more engaged if he or she knows that the knowledge and the skills acquired in a course will be of use in other contexts. Participating in the course offers much more opportunity than simply receiving the course content for the purposes of passing the final exam. Hull makes this explicit as one of his course design goals: “providing students with 21st-century media skills.”

Students are more engaged when there is a sense of a learning community. In each of these cases, the students, through interactions among themselves, developed a sense of themselves as a learning community. This sense of community can be encouraged through a device as simple as Hull’s “film festival,” the class meeting at which the best of the video assignments were aired. Community can also be fostered by exercises such as those described by Gredone, who notes: “Students learn from each other . . . and discover how to capitalize on their classmates’ different skill sets.”

Students are more engaged when they help to steer the ship. The use of Twitter by Green and Hull illustrates that providing students with a sense of empowerment leads directly to a sense of engagement. The backchannel discussion allows students to help “steer” the course of a class session. As Jacobs puts it: “Students very much appreciate opportunities to be teachers who can influence the learning of others.”

Students are more engaged when story and narrative are used effectively. Both Hull and Jacobs use assignments based in story and narration. The use of video and images as the medium for this narration has, as we learn from Jacobs, a dual effect: not only is narration engaging in
its own right, but Jacobs encourages his students “to learn how to tell their own stories as a way of influencing how the media in turn portrays them.” Students can learn more about the media and how it works by becoming media producers.

An additional theme that emerges from these five summaries is the need to evaluate and to determine what works well and what does not. Gredone succinctly states: “All of these [technology] choices and their varieties are evolving—hence the need to constantly evaluate and change them along the way.” Green was assiduous in surveying his students to see which of the technologies were effective and which were not. One of his primary objectives was “to gather baseline data related to the adoption of emergent technologies by students and document improved academic successes.” With so many options, gathering some measure of evidence as to what is effective, and for whom, becomes essential.

There is no magic formula for generating student engagement; no single method or technique will produce satisfactory results every time. As circumstances vary, instructors and course designers will need to take them into account. Nevertheless, these five summaries provide some very good leads, points of departure, and ways of getting started. The sharing of our experiences, as these five faculty have done, fosters a dialogue that moves us toward engagement, toward providing more meaningful educational experiences for our students.

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