



Training in the 21st Century: From Sage on the Stage to Guide on the Side

Photos by New Mexico Energy\$mart
Academy at Santa Fe Community College

Imagine you have just walked into the classroom. Right now the teacher is standing at the front, explaining some of the finer details of the second law of thermodynamics. The students are sitting at tables, listening intently (or looking a bit lost), taking notes. One student raises his hand and asks the instructor to clarify a point he did not understand.



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This particular class is taking place in 1914, not 2014. And yet I bet you could recognize this same scene if you went into many of the classes where building science is taught today. And what's the big problem? Since 1914 we've had the invention of television, the Internet, mobile devices, YouTube, Facebook, Twitter, and more. So, given all this change, why are we still teaching like it's the 20th century? Why haven't our educational models caught up to the 21st century? Why are we all still listening to an instructor tell us how it is, while he or she hands out training

materials and expects us to memorize details in the same way we did in the last century?

Times They Are A-Changing

At least in 1914 we had strong apprenticeship models. The scene we played out at that time was most likely taking place in an academic setting, while so much more learning went on through the relationship of the master (builder, welder, and so on) and the apprentice preparing to enter a trade. Given that, it's even weirder to expect energy auditors and others working in the home energy field to be doing so much of their teaching and learning in a text-based, old-style classroom-based environment.

There are a lot of great hands-on training centers out there. I guarantee you, though, that in nearly all of those fine places, students are still spending part of their time in this traditional classroom-style mode of learning. Why are we still fixated on this type of training method?

I think we still tend to teach in the old-fashioned way because it is the type of teaching and learning environment that most trainers themselves learned in and feel comfortable with. They enjoy being the Sage on the Stage, expounding and explaining their hard-earned knowledge. But most trainers know that they have learned a lot more about their subject



Students at Santa Fe Community College exploring how an insulation machine works.

by teaching it than they learned when they were in class listening to someone else teach.

Learning theory has advanced enormously since the start of the last century, when we were training people for an industrial economy. Workers then needed to be able to take direction, fit into the system, and stay focused on their particular job. Back then, we created an educational model to fit that style of world. Now, however, we are in a century where more information than we would ever need is available in everyone's pockets; the

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Getting first-hand experience with an adsorber heating and cooling system.

top ten in-demand jobs last year didn't even exist in 2004; and people need to be flexible, creative problem solvers who know how and where to find information, not just how to regurgitate it.

Wouldn't you expect a doctor to know something about the theory of medicine? Well, we have many instructors who have never been exposed to the theory of how people learn, so it's no wonder so many of us teach as we were taught.

A New Model for Teaching: Guide on the Side

We now know that people learn effectively when they construct their own learning, rather than being told about it. The instructor moves off the stage and becomes the Guide on the Side. How can this be done in a typical class? Don't the students need to learn a certain amount of subject material, and isn't that best done with a PowerPoint and a teacher explaining it? Well, one thing some instructors are doing is flipping their classroom. This means taking the information that they cover with the students sitting passively and recording it in short bite-sized videos that the students can watch on their own. There are many great resources to help you do this. Some of them are

listed at the end of this article. These resources can be posted on YouTube, Vimeo, or your web site, and instead of sitting in class listening to you talk, students can access them anywhere, at their convenience. And often you don't even need to learn to record videos—there are great ones already available online, from places such as Weatherization TV, Southface, Building Media, Incorporated, and more.

That way, when students are in class, they can spend their time more productively—discussing questions, working with their peers, or learning in the field. No more blank, bored faces staring up at you as you talk. This also means that students don't need to spend as much time in class, enabling you to keep your class fees more competitive and attract students who cannot take too much time off work. (See "A Day in the Life of Learning" for specific examples on being a Guide on the Side.)

Or how about even more of a flip: Have your students record audit steps, for example, at home using their smart phones, and then share them in class with their fellow students. Or in class they can pair up and make mock documentaries about what they are learning,



Getting hands-on with a blower door.

which can then be shared and critiqued in the time that they would otherwise be spending watching you tell them how to do it.

And that's another way that people learn well—in social settings. Learning is a social experience. Students will usually learn better from their peers than from you, while they make mistakes and correct each other. Giving them the time and space to work with each other rather than showing them how you do something makes for a better learning experience.

Students are also connecting with each other online socially, so why not encourage them to connect with their peers professionally? There are many well-known people from

A Day in the Life of Learning BY J WEST

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So you're a **Sage on the Stage**, but you want to be a **Guide on the Side**. Or maybe you just aren't convinced—you know you're set in your ways. Do you know where to begin? How to design curriculum that fits? Maybe it'll help if we take a look at a typical day in the life of learning for a specific Guide on the Side—me. Let me share a way I leverage blended learning and cognitive psychology to design and deliver modern instruction.

8:00–8:45 AM

Engage

Let's begin the day with a collaborative meeting. This is a chance to prepare learners for the day by

- energizing and engaging them;
- helping them feel their input is important;
- explaining the agenda;
- defining the goals of the instruction;
- assessing previous experience;
- discussing learner needs; and
- establishing a safe, collaborative environment.

9:00–9:45 AM

Flipped Class

In a flipped classroom, the learners are asked to interact with course content on their own or in a small group before they gather as a class. Let's call this self-study.

Self-study is intended to explain knowledge and skills that learners will need in order to build and demonstrate expertise in a specific task critical to workplace performance.

Suffice it to say, when they gather together, they should be prepared to discuss or practice the course content they engaged.

10:00–10:45 AM

Challenge

Design exercises where learners are challenged to practice the skills they need to complete a critical task. Be sure to place exercises in the context of real-world problems, so they will consistently simulate those critical tasks. The exercise must have an outcome or product that can be shared with the class.

There are many exercise types. Among the most common ones are

- role playing typical scenarios;
- predicting outcomes from real case studies;

- critiquing (video, stories, etc.);
- troubleshooting equipment problems or test results; and
- building props.

Try to plan small-group or solo exercises. The size of the group (including solo) is normally dictated by class size and resources.

The ability to support and facilitate these exercises is critical for an effective Guide on the Side.

11:00–11:45 AM

Exercise Delivery and Peer Review

Pull up your big-person facilitator boots for this part of the day. Encourage respect and elicit positive, meaningful peer feedback. If you can maintain some semblance of order and respect, the learners will really benefit. The goal for a peer review is to motivate students.

11:45 AM–12 NOON

Topic Review

You might want to hand out a quiz to complete in class or show images on the monitor and ask learners to use what they learned to describe or critique them.

12 NOON–1:00 PM

Lunch

When the learners' minds get saturated, they stop learning. Make sure they get a solid lunch break. I always avoid the old if-we-work-through-lunch-can-we-leave-early deal.

1:00–1:45 PM

Game Time

There are few options after lunch that engage the learner better than a game. Gamification is based on the idea that humans like to interact and have fun. And that keeps people alert after a double cheeseburger. For examples of great learning games, Google

- Better Me;
- Critical List;
- Facts in Five;
- Hit or Myth; and
- Jeopardy (you probably don't need to Google that one).

2:00–2:45 PM

Self-Guided Discovery

Design this activity as a solo or partner (if you have a large class) event. The goal is to let learners take full responsibility for their own learning. This is a great way to introduce a second topic or subtopic for the day. Formats include

- scavenger hunts;
- critical lists; and
- flash presentations.

3:00–3:45 PM

Challenge 2

Try a different exercise than you did earlier in the day.

4:00–4:45 PM

Discuss and Prepare (AKA Flex Time)

If you're like me, your instructional events tend to run long. If it isn't a piece of technology that fails, it's a delay returning from lunch or an alien abduction. It's a good idea to plan some flextime at the end of every day.

Use the time to ask for the learners' opinions and feelings about their experiences. Also, take time to make sure they are prepared for future classes.

4:45–5:00 PM

Daily Wrap-Up

Have each learner share something that he or she learned today. Try to make each student provide a personal response. It's a good idea to start the activity with something you learned. Be sure to demonstrate the proper format for the class.



Peer-to-peer learning—figuring out how to program a manometer together.



Students at Santa Fe Community College taking a break to discuss a problem.

the industry on Twitter and Facebook; there are groups such as those on LinkedIn and Home Energy Pros. *Home Energy* magazine itself is a wonderful resource for them to know about. Encourage them as part of their classwork to go online and find answers to questions you pose—either researching informational web sites or asking others. That way, once they have left your class, they have the networks and resources to continue their learning. The model of the all-knowledgeable teacher is not necessary in this always-connected world.

Think of the debate going on in the industry right now around ventilation. What textbook

or instructor can provide a better, more current view of the various ideas involved than blogs like Green Building Advisor or Energy Vanguard do, with their direct interviews with the key players and the back and forth that goes on in the comments. Encourage your students to read them and even get involved in the discussion themselves.

Learning from Games


Think about how engaged you feel when you are playing a good game. The sense of involvement and participation you feel, the challenge, and the fun. Well, trainers are now using games in classes and online to engage their students. From simple Jeopardy and polling games to more complex simulations such as Intercaz, Energy 2-D, or Second Life, these provide students with another way to engage in their learning experience. Santa Fe Community College and the Concord Consortium are creating an online simulation game (SimBuilding) exploring building science concepts. This should be available in the few years. Some of the concepts students need to grasp in building science are difficult, as they are either on the macro or micro scale. Houses operate over long periods of time, through different seasons. And it's hard to

imagine water vapor movement inside walls. SimBuilding will use innovative simulations so students can interact with the building in these macro and micro worlds in a game-like environment. Expect more and more of these types of training tools to become available in the coming years. Well-done simulations and games have proven to be excellent vehicles for learning.

But I'm Old-Fashioned!

You may be thinking that you're not that good with technology. Record videos? Use Twitter? Play simulations? I'm just not up to all that.

As John Cotton Dana once said: "Who dares to teach must never cease to learn."

We shouldn't be expecting our students to learn without going through the experience ourselves. Challenge yourself to try one new thing every class you teach. Step outside your comfort zone, and you'll find it's a lot easier than you think. It can be really fun to be a student! 

Some information in this article is based upon work supported by the National Science Foundation under Grant No. 1304479. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

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Flipping the classroom resources:

Camtasia: www.techsmith.com/camtasia.html

Jing: www.techsmith.com/jing.html

Screenr: www.screenr.com

What Is the Flipped Classroom?: www.flippedclassroom.com

Other resources:

Energy 2D: <http://energy.concord.org/energy2d>

Energy Vanguard: www.energyvanguard.com/blog-building-science-hers-bpi

Green Building Advisor: www.greenbuildingadvisor.com

Intercaz: www.interplayenergy.com/intercaz

Second Life: <http://secondlife.com>