AUTODESK UNIVERSITY 2013

Standards + Training + Video = Productivity

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Are you responsible for training your CAD users but feel overwhelmed by the task? Are you stymied by the problems associated with enforcing CAD standards? Does your management expect you to make your users more productive? In this class, we cover some strategies for combining standards development and enforcement with an in-house training program to solve all 3 problems at once while keeping your budget under control. We start by building your company training program via efficiency analysis, move into creating effective training materials, and then we give you some ideas for becoming a better instructor. Next, we talk about turning your training program into your standards program by using your own written and video files to build a virtual resource library. If you're responsible for creating a standards or training program, you can't afford to miss this class.

Learning Objectives

At the end of this class, you will be able to:

- Create and deploy cost-justified standards
- Deliver training to maximize standards usage
- Maximize user efficiency via standards
- Recycle standards and training materials

About the Speaker

Robert is head of the Robert Green Consulting Group, and an 18 year veteran speaker at Autodesk University. You have likely read his work in Cadalyst magazine, where he authors the CAD Manager; column, or in his bi-monthly CAD Manager's Newsletter. He holds a degree in mechanical engineering from the Georgia Institute of Technology, and gained his CAD skills from 28 years of AutoCAD®, MicroStation®, and various MCAD software systems. Since starting his own company in 1991, Robert has performed consulting and teaching duties for private clients throughout the United States, Canada and Europe.

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Note on Handouts

I view my course handouts as a resource you can skim before the presentation and read in more detail after the presentation. I also sometimes post revised handouts after AU is completed so be sure to check back for any updates.

Foreword

I don't have to tell you that managing CAD standards and training programs aren't easy because you already know that. I also don't have to tell you that CAD tools are always changing and that managing that change and standardizing the tools over time is a key element in being a successful CAD manager. The hard part is doing the research and implementing new tools while also managing a production environment.

In this course I'll share an approach to managing CAD tools via standardization, training and video documentation that has served me well at a number of client companies. I like to break my approach down like this:

- Create standards that work for the user
- Test the standards to verify functionality
- Train users on the standards using project context
- Document everything in video so you can standardize your training

Win the Users by Fixing Problems

Would your users love you if you could make their persistent annoying problems go away? Of course they would because you'd make their job easier and more pleasant by doing so. It's simple psychology and it only requires you to do the following:

- Find annoying problems you can fix
- Fix the problems via testing
- Calculate time savings
- Train users on the new methods
- Make your fixes stick with standards

What you're essentially doing in this process is identifying CAD related problems that make life miserable for your CAD users that you can actually fix. You then deliver your proposed fix and sell it to users based on ease of use and time savings for them. After you have the user's attention you give them some training on using your solution so they see for themselves how much they like it. Once you've gotten to this point adopting your solution as a new standard is a foregone conclusion.

Finding Fixable Problems

Want to find the problems that you can fix with standards? Look for the annoying everyday issues that users complain about all the time. Things like plotting, file management, templates, and standard content like blocks, families and components are all great examples. The common denominator you'll see in "fixable problems" is that you can overcome the problem using tools you already have to customize and train in your CAD environment so you don't have to go purchase new hardware, software or training materials to fix the problem.

Fixable problems are almost always usability issues (plotting ease, standard blocks) not money intensive issues (new computers, new plotters, etc). Spend your time fixing what you can actually fix and your users will appreciate your efforts!

Ease of Use Rules!

One of the main topics I try to stress in formulating CAD standards, or any type of standard procedure, is that it has to be easy to use. When users perceive CAD standards as something that helps them accomplish their work in fewer steps they'll view standards as a good thing. Therefore a key part of getting standards in place is stressing to all who'll listen that standards make users' jobs easier via better, cleaner processes. Of course the inverse is when standards actually increase steps by building bureaucratic barriers that make users hesitant to follow your standards then you're not making things easier right?

Automate/Configure for Greater Ease

Want to make using standard details in AutoCAD easier? Do so by creating palletized detail libraries that pop up on the user's desktop.

Want to make using standard parts easier in your Inventor environment? Catalog all your parts in a consistent network location and deploy to everyone.

Want to make using plumbing fixtures easier for architects in Revit? Deploy the content families required on your network.

The common denominator in these examples is that you make it so automatic to use your standards that users would be nuts to do anything else. And if you can program complex tasks so much the better!

The CAD Standards Proving Ground

In a CAD context I view the proving ground as a collection of test machines and users who can put new standards, procedures and software through a controlled barrage of testing to find out what works and what doesn't. The mental image that emerges for me is that of a test pilot because test pilots understand the following:

- The craft they're flying may have problems
- They may have to use the ejection seat
- They can convey information to flight engineers

And in addition these test pilots will help me verify other important aspects of software implementation and standardization like:

- Training materials
- Standards configurations
- Best practices

The CAD proving ground therefore becomes the ideal place for the CAD manager to get new CAD standards ready to implement.

Find Your Test Pilots

The proving ground will only be as good as the test pilots you recruit. Software test pilots are a special breed of user that knows they'll be trying out new tools that will almost certainly crash for some while before being production ready and are excited to be a part of the process. These test pilot candidates must exhibit the following traits to be successful:

- Strong desire to learn new software
- Calm when confronted with problems
- Ability to communicate problems clearly
- The desire to follow through until finished

Give me a few test pilots with these attributes and I can promise that I'll be able to evaluate new CAD software and make it work. Without these test pilots new software will be released to the general user population who will panic when confronted with anything that doesn't work perfectly the first time. Does that latter scenario sound familiar to you?

Admit it. You already know who your test pilots are doing you?

Support and Interview Your Pilots

As your test pilots evaluate your new standards in the proving ground be ready to work with them and support them so that you can learn from their experiences. To do so always do the following:

- Note any problems your pilots have
- Ask what symptoms they noticed
- Ask them what confused them
- Ask them what would make things easier
- Ask them how they would teach users

This interviewing process is called debriefing in test pilot environments and is key to getting the greatest value from your proving ground. So don't just let your test pilot say "this is great" or "this stinks" make them explain what they experienced.

Iterate and Improve Standards

Now that your test pilots have given you're their feedback it is time for you to adjust your software, document (for training purposes later), develop and otherwise tweak the proving ground so that the next test pilot flight will be smoother and more successful.

After you've done everything you can to improve the software you'll be ready for another test pilot mission and interviewing session. And so the iterative process of testing and fixing will go until your test pilots report that the software is ready to go.

When should you do this? As soon after the test pilot testing as possible – ideally immediately after.

Why? To work through the problems while all the information is fresh in yours and the test pilot's minds. The sooner you tackle the problems the greater the chance of solution.

How often should you iterate? As much as you can.

Why? Because the more you test the better the software will be when production implementation goes forward.

What next? Training!

Why Train Users?

The conversation all starts with this doesn't it? After all, if the value of training was obvious to all you'd already be training people. And when you go ask your boss to fund a training program you know you'll be asked "Why should we spend money on that?" When questioned it pays to have some solid answers in mind, here are a few I find most management teams understand:

To teach and enforce standards. If you have trouble getting people to comprehend and follow standards it is either because they don't understand or are just stubborn. Training gets rid of the first problem by demonstrating proper standards usage while exposing stubborn users for what they are - stubborn.

To implement custom procedures. In order to automate redundant procedures like plotting, symbol insertions, filing, archiving, transmittals, etc. you'll need to create custom programs and procedures. And in order for users to benefit from these procedures you'll need to show them how to use your tools. Training is the answer.

To fix problems. If users have trouble performing certain software tasks you need to intervene by explaining the problem and detailing how to work around it. Training is the answer.

To save money. If you train users on the correct way to use your software it stands to reason that they won't make as many errors and save time. And since we all know that time is money you can see that training will lead to savings if done properly.

Note that everything I did to address training was focused on improved efficiency, labor savings and cost savings. At the end of the day the only reason management will approve training is because it is in their interest to do so, right? Make it easy for them to see the benefit by talking about cost savings.

Approach it Financially via Standards

Let's assume that your boss sees the wisdom of your training proposal and tells you to get a training program in place. Now the fun begins! To get your training program up and rolling you need to perform some basic planning and analysis to make sure you're on the right track. I recommend writing down the following, at minimum:

Topics and outcomes. What standards will you teach, to whom and what will the result be?

Savings estimates. As a result of achieving your training outcomes how many man hours will your company save on an annual basis?

Cost estimates. How much it will cost to prepare the training (your time) and how many man hours will be expended on users.

Do the Math

As an example a two hour training class for fifteen users would consume 30 (2 x 15) man hours of training time. If it takes you 10 hours to prepare for the class then the total man hours associated with the training would be 40 (30 + 10) hours.

You'll now prepare a financial justification for your training classes like this:

- List your topic
- List out the savings you can achieve
- List the costs of preparing/delivering
- Divide savings by cost to get ROI

Course Title	Savings (hrs/yr)	Costs (hrs)	ROI
Plotting standards	240	40	240/40 = 6

Do this for each training module you hope to conduct and start building a master spreadsheet to keep track of everything.

Making the Final Training Pitch

Now that you know what you'll teach, why you'll teach it, how much you can save and what return on investment you can achieve it is time to take your ideas to management and get your program approved. Here are some hints for making your training pitch get maximum effect:

Use a spreadsheet. It looks professional; managers know spreadsheets and will respect you for making your training proposal in a management friendly medium.

Quote the numbers. Make sure to show your ROI calculations and list your training topics with the highest ROI values at the top of the list to show what your priorities will be as the training program kicks off.

Keep it short and simple. A single sheet Excel file is elegant and easy to read so you know your boss will read it. A multiple sheet document is less likely to be read and detracts from the great ROI impact. Don't let an overly complex write up bore your boss out of reading your numbers.

Don't Forget. As you talk with management about your desire to train users on your new standards don't forget to mention the following key points:

- You must emphasize that standards require training
- You must emphasize that training reinforce standards
- Show that financial payback is only obtained when good standards collide with a great training program.

Building Your Own Training Materials via Video

Running a training class without training materials is, in my experience, a waste of time. Since most people don't take good notes during a class, it becomes the instructor's responsibility to provide a handout or workbook that chronicles the training. After all, as soon as people walk out of a training class, the only resources they have to fall back on are their memory and the handouts you provide.

Since I've advocated targeted training that solves your company's specific problems, it is obvious that you can't go to Border's Books and buy a training workbook for your company, right? That means that you'll have to create your own training materials. Before you panic I'll give you some suggestions for creating quality handout materials in an easy manner. You don't need anything other than your CAD application and a good word processing tool to build your own training materials. Here's how:

- **First.** Purchase some software tools to help compile, record and publish your training materials. My favorite software tools are Camtasia and SnagIt (www.techsmith.com).
- **Second.** Conceptualize what you'll be teaching and then come up with some example files you can use to illustrate/demonstrate the concept. Don't worry about anything polished at this point; just make sure you can convey the information to your students with the example files you've created.
- **Third.** Now turn on Camtasia, put on your headset microphone, and run through your lesson just as if you were running a training class. If you flub up, don't worry; just keep going as if you were in a real class. I recommend taking a laptop into a conference room or working at home so you won't have to deal with phone interruptions while recording your lessons. When you have finished, close out your Camtasia session and save the file so you can find it later.
- **Fourth.** Using your recorded presentation as a guide, open your word processor and work through your lesson, recording your text and capturing graphics into the open document. Don't forget to save often! Don't worry about spelling or polished formatting; just get the content into your text document.
- **Fifth.** Finish your handout by spell checking, adjusting syntax and formatting your document to make it look good. Do several printouts and keep adjusting the handout until you're happy with it. Congratulations — you're done!

As you create training materials, always strive for concise wording, illustrative screen captures and clean layout as the most important attributes. After all, if your materials are easy to read and visually rich, people will look forward to attending your training!

Deliver the Training Live

Now that you know what you are teaching and you have your materials, simply deploy your training program using either instructor-led training sessions or informal meetings like lunch-and-learn sessions. In any case, I recommend the following steps to make your training sessions go smoothly:

- **Use a projector.** I've learned it's impossible to train without some way to demonstrate what you're teaching, and projectors work the best.
- **Have your handouts ready.** Don't start training until you have the materials copied, bound and ready.
- **Insist on timeliness.** Set a starting time and stick to it. Late arrivers should be expected to make up for lost time on their own. Set the tone that training is valuable and so is your time as the instructor.
- **Have a sign-in sheet.** This sheet documents who was there and who wasn't. It also makes it easy to spot those who say they want training but don't show up for it. You'll also be able to demonstrate to your management that people are coming to your training sessions.
- **Record what you do.** If training is worth doing it is worth recording for later use. This may require you do purchase a wireless microphone, but the payoff is training on demand by simply replaying video recordings.
- **Do a wrap-up write-up.** After your training is complete, summarize how it all went and forward a copy to your manager. This is a small bit of self-promotion that you need to do so that your management knows what you've accomplished.

If you've done all the hard work to prepare your training topic list, materials and additional resources, don't scrimp on the delivery! Use the tips above to get consistently good, reusable training results.

Alternative Ways to Deliver Training

Here are a few other ideas for training delivery you might consider:

- Use lunch-and-learn time slots to deliver "bite sized" training to a wide audience.
- Catalog all your recorded videos to make your own training videos.
- Use these methodologies to create training for your standards and procedures, and you'll end up with a video standards guide.

Preparing Training with Video in Mind

In order to make the best use of video you'll need to think about your presentation and practice is a bit before you record. I call this process story boarding because you'll create an outline and narrative story to use in your video. Think of your story board as a rough draft of your video.

For me, the key aspects of a good story board are as follows:

- Having a good data set to use
- Having a well defined standard concept to teach
- Knowing the steps (order) you'll teach with
- Knowing all command keystrokes and dialogs
- Having a good sense of pacing

The good news is that most CAD managers have an intuitive sense of how to present examples on using software so story boarding is easy.

Rough Draft Video

Instead of writing a script to then turn into a video consider recording rough draft videos first to get the correct flow and pacing established. Once you have everything dialed in you can transpose your spoken word into handouts as needed.

The keys to making rough draft videos are:

- Pretend you're teaching a user the concept.
- Move at a normal speed.
- Do not stop even if you mess up

Now simply go back and listen/watch what you did and make notes on what you'd change? Once you have your notes simply try it again. Repeat until you've got it down pat.

Keep It Short and Modular

As you plan your videos keep in mind that they will likely be consumed in short intervals as time is available for the user. Shoot for 5-7 minutes per installment so users can watch one module at a time.

By keeping videos short you'll not only retain the user's attention but you'll also make it much easier to deal with the resulting video files which can be substantial.

Machine, Hardware and Software Considerations

In order to start making training videos you'll need to get your recording environment setup properly. Here are some general guidelines you can use to get a functional recording environment that yields high quality results without going broke:

Computer: If your machine can run CAD applications efficiently it should be up to the task of capturing audio/video. I like to use my laptop as my recording platform simply because I can take it with me and record training sessions on site easily. I use a Windows 7 based Quad-Core with 8 Gigabytes of RAM but have used machines with less beefy specs just fine.

Software: I use Camtasia Studio (www.camtasia.com) as my recording application. Camtasia's strength is that it can produce videos in virtually any format (Windows Media, Real Media, QuickTime, Flash, etc) and supports the widest variety of audio formats and interfaces as well. While Camtasia isn't cheap at $299 (you can download a fully functional 30 trial version to try it out) I find that the capabilities it provides are worth the cost.

Camtasia's little brother – Jing (www.techsmith.com/jing.html) you – can also be used to create short duration training videos. While less powerful than Camtasia, Jing has the advantage of being very cheap (even free) so you can see how you like making videos with little investment.

Audio hardware: A big part of making training videos is the narration you provide, so the quality of audio you record is an integral piece of the overall experience. To capture the audio with the highest quality you need to use a good microphone. I recommend USB interface microphone (like the Blue Snowball, Blue Yeti (that's what I use) or MXL 990.) which bypasses your computer's low quality analog input jack in favor of a digital recording interface. And while getting the volume levels set on the USB microphone set requires a little tweaking, you'll be rewarded with much better sound.

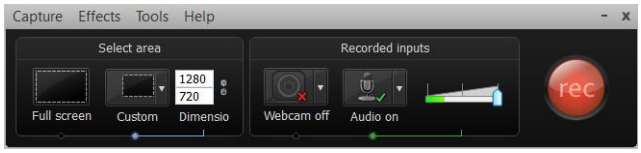
You can find a variety of USB headset style microphones at most any office or computer store these days. Headset units are great for presenters who want to stand up and move, while the desk based units provide better audio for those who are stationary at the keyboard. None of these units are very expensive while all provide much better audio than a low end analog mic like you'd plug into your computer's microphone jack.

Setting Video Recording Parameters

Even though your company might have super high resolution graphics cards and monitors you probably want to record your training videos using 1024 x 768 resolution for playback on most computers or 1280 x 720 for playback on HD 720 monitors. If you record at higher resolutions you run the risk of not being able to display the videos on lower resolution machines. Finally, recording at lower resolutions will keep your video file sizes smaller and easier to move over networks later.

Setting Audio Recording Parameters

For audio settings you want to record at a quality that captures the quality of the higher quality microphone you've purchased yet not go overboard by recording at CD quality. Remember that the higher quality audio you record the bigger your video file sizes will be. Access the audio settings from Camtasia's Tools - Options control as shown here:



Now set your microphone values as shown here:

Setting audio to 22050 Hz and 16 Bit mono resolution yields great speech quality recording while keeping file sizes reasonably compact.

Now that you've defined the area you'll record and have your microphone configured we'll turn our attention to the Effects Dialog so you can create custom controls that illustrate mouse movements and click actions. Here are the key settings you'll want to activate in order of appearance in the menu.

Try Some Test Recordings

Now is your chance to take a few trial runs at recording and playback your results. You'll become more familiar with the Camtasia application as you work with it and you'll have the chance to get your microphone positioned properly and get all your volume settings tweaked properly.

As you make your trial runs take notes so you'll remember the settings you like best and let a few of your trusted power users look at and listen to the results to see what they think. The goal is simply to get a good recording with good quality audio so that your future recordings will be easy to work with.

Presentation Tips

In order for any presentation, whether video or not, to work well you'll need to alter your presentation technique to convey maximum comprehension. Therefore I'd like to start off with some concepts that I see missed a lot in video presentations and explain each briefly.

Show the end state: Before you begin a lesson tell the user what the outcome will be and show them what the output will look like when finished. When the user knows what you're trying to achieve it'll be much easier for them to follow along.

State the approach: After showing the end result give a quick, high level description of what the lesson will contain. Again, when the user knows the approach you'll use it is much more likely that they'll understand.

Start at the absolute beginning: Even if you think your audience already knows a concept it is wise to briefly state it. There's nothing worse than not understanding a presentation because a simple step up front wasn't explained.

Move at a calm pace: Don't be to slow but be sure not to be too fast. If you move too fast somebody will get lost.

Talk as you go: Explain everything as you go along reference the stated approach you gave at the beginning of the presentation. Use action phrases like "I'll move the mouse" and "I'll click this dialog" so everyone knows what's going on. By talking as you go you'll also avoid "Dead Air" where the user is only left to guess what you're doing.

Make sure they see the mouse: Sometimes experienced users zap through mouse movements so fast that the person watching can't see the mouse. Slow down your mouse movements so they can be seen and consider enabling mouse trails.

Click, double click, right click: Make sure to explain when you are clicking and when you are double clicking and when you are right clicking on the mouse. Remember that the person watching can't see you work the mouse so you have to state what operation is happening.

Action – Time to Record

Now it's show time! Time to use the settings you have configured and run through a sample training presentation in recording mode. Try something simple to start and then replay it to evaluate sound levels, cursor effects, pacing, sound level, everything!

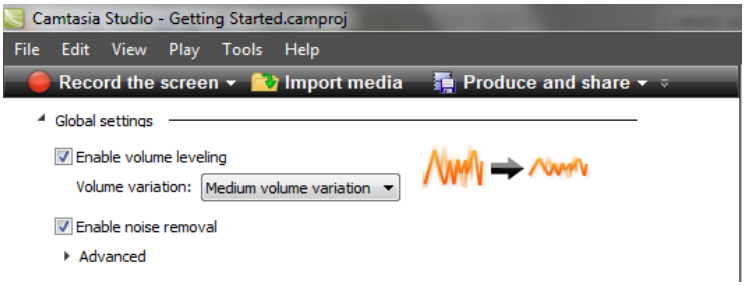
Keep tweaking your settings until you like what you see and then record some real training sessions. Now you're making videos! That wasn't so bad was it?

Use Zoom and Pan (Key Framing)

If you want to produce videos that may be viewed on a tablet or smart phone it can be useful to build automatic zooms into your video production. To access this function use the Tools -> Zoom n Pan menu. You may now place zoom windows around the areas of the video you wish to highlight and a smooth zooming effect will be provided when producing your video.

Produce Your Work

The final step is to turn your recordings into finished sessions for playback by your users. While Camtasia is a full featured editing system you'll probably just want to produce the video captures as they are for now. In order to do this here are a few hints:



Access the Audio tools screen (as shown here) by selecting the Tools -> Audio menu.

Enable volume leveling to smooth out peaks in speech levels.

Enable noise removal to eliminate background hiss and ambient noise (kind of like noise cancelling headphones).

Where Will the Videos Go?

Ultimately you'll be creating a library of video segments which will be of substantial size. The logical question becomes where will all these videos be stored and how will your users access them? The decisions you make may very well affect how your videos will be produced and shared.

Here are a few example scenarios:

One office location. In this case videos will likely be housed on a local area network (LAN) that can move even larger sized files with ease. These environments aren't sensitive to file size so I don't have to worry about achieving compact files sizes or using streaming video technology (like Adobe Flash).

Multiple office locations. In this case videos will have to move over a wide area network (WAN) which can suffer from limited bandwidth and slow transfers. These environments mean I'll need to think about streaming video, compact files sizes or both. Bottom line: Users won't watch my videos if it takes forever to download them over the company WAN.

Iterate, Repeat and Improve

If you're like me you'll keep experimenting and making tweaks to your recording setup – after all there's no better way to zero in on what really works best for you. As you find your comfort zone with Camtasia I find it helpful to keep these things in mind:

> **A good video simply conveys the content.** Or put another way if you teach well the video will help you teach but if you don't teach well the video won't hide that fact.
>
> **Spend time on getting your exercises and example tight**. Then the video will take care of itself.
>
> **Don't stress about perfection.** You're going to have some mis-speaks and glitches just be yourself and you'll do fine.
>
> **Target the audience.** Create videos that are appropriate for your user's needs – nothing more and nothing less.

As you work at it more it'll become natural and you won't even remember that you're being recorded!

Keep At It!

I realize that creating training videos is new for many of you and may not seem comfortable at first but I highly recommend that you try it out. I believe video based training is going to be the default training mode in the coming years anyway so why not get acquainted with the concepts now?

So go ahead and download the trial software and give it a try. You may find out that you like the process and can add it to your bag of CAD management tricks faster than you think.

PowerPoints and Materials

You can download updated course handouts (with any additional notes or corrections) for all my presentations at my web site www.CAD-Manager.com on the **AU013** page. You can find a wide range of information on customization, programming and CAD management elsewhere on my web site.

I will send you a PDF copy of the session PowerPoint presentation if you request it. Just send an email to me at rgreen@cad-manager.com and be sure to put the course title in the subject line of your message so I'll know which class you want.

Legal Stuff