Developing Custom Training Solutions

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Abstract

A well-developed training program is essential for users to gain the skills they need to maximize the full power of the SAS® System. Recognizing the diversity of users and their training needs, SAS Institute offers a broad curriculum of training spanning several media: self-paced SAS/TUTOR® online training software, video-based courses and tutorials, and instructor-based training. There are obvious advantages to a training program utilizing multiple media. Formats can be effectively mixed and matched to allow users to meet their personal training needs. Cost-effective training mixes can also help you stretch your training dollars. Examples of mixed media solutions to training needs are presented for consideration.

Efficient use of the SAS System is the common denominator for all organizations seeking training, but each organization has unique elements of operation. Because there is no universal training solution, the Institute offers you the option of customizing its training to meet your special needs. Standard IBT courses can be customized by combining segments from several different courses or adding site-specific information. Video-based training can also be customized. Other custom options include one-on-one site-specific assistance in designing applications, building prototype online systems, reviewing code for efficiency, and other personalized technical assistance.

Introduction

This paper reviews the various training products and services from SAS Institute that can be used to provide a custom training solution for those needing to learn to use SAS software and suggests criteria to consider in choosing a training solution. It illustrates how and when the various media can be put together to form an efficient, effective, and complete custom training solution for any organization.

The Current Business Atmosphere

The 1992 Industry Report published by *Training* magazine, which reported on the training practices of organizations in the U.S., indicates that employee training is a huge activity. The survey indicated that companies budgeted 45 billion dollars for training in 1992, to train 40.9 million employees.

The survey also reported that 52% of all organizations responding cut budgets or staff in some areas because of the recession. Of those that cut something, 60% cut training budgets. The result is that companies are looking to make existing employees more productive with fewer training dollars.

SAS Institute strives to provide a wide range of course topics in different media to enable organizations to design cost-effective training solutions to stretch their training dollars.

Who Needs a SAS Training Solution?

Assuming that you or your organization uses SAS software, you need a SAS training solution.

If you are

- a professional trainer who provides training on SAS software
- a manager responsible for making sure that people who report to you are appropriately trained to use SAS software
- an MIS executive considering training for your whole information services organization
- an individual responsible for your own training

you need some kind of training (for yourself or others) on SAS software.

If you are

- looking for ways to increase the productivity of your employees
- trying to improve the quality of your SAS training program

you need to investigate the variety of training options available.

Whether

- SAS software is new to your organization or has been used for years
- you have unlimited funds to spend on training or very little to spend
- you are responsible for training one person or thousands of people
- your users are beginning end users or professional programmers
- you use training from SAS Institute or another vendor

you should consider all SAS training options and put together a custom cost-effective training plan to best fit your needs.

Available Training Media

A brief review of the benefits of the various media follows.

Instructor-based training (IBT) is usually compressed into a short time frame, is quick and concise, and can be customized, by combining selected segments of specific courses, or adding site- specific or industry-specific information. It tends to be more expensive than other media. One of the most important features of IBT courses is the student's ability to interact with the instructor. Public instructor-based courses are good when you have a few people to train on a particular subject. On-site instructor-based courses are good for training a larger number at the same time on the same subject. More personalized on-site technical assistance is also available if you need help designing applications, building prototype online systems,

reviewing SAS code for efficiency, maximizing the use of SAS software for statistical analysis, or installing the SAS System.

Trainer's Kits provide your instructor with the materials needed to present an instructor-based course. .This approach is usually less expensive than sending people to public courses or having on-site courses. However, it does require that you have someone on staff who is capable of teaching, is knowledgeable about SAS software, and has the time to teach. A SAS Trainer's Kit is economical, and it can be easily supplemented and customized. Murto (1991) gives a good example of how to do this. You can also schedule courses when it is convenient for you and for your students.

Video instruction can be full-length courses for detailed instruction, with computer exercises, or shorter video tutorials for a quick introduction on specific topics. As Brinsfield and Livingston (1991) point out, "Tutorials are limited in scope and are designed to get learners quickly up to speed on selected topics. These will appeal to learners who want to integrate new information into an existing knowledge base or get an overview of the functionality of new software."

Video training is economical, self-paced, easily accessible, portable and flexible, and it can be used individually or in a classroom setting. Video courses have historically been used as self-paced instruction, but more recently companies are finding it more effective to show videos in a classroom setting with a facilitator to answer questions and help in computer workshops.

The 1992 Industry Report published in *Training* magazine indicates that U.S. companies are most likely to choose video as the method for providing training to their employees. 92% of the companies surveyed used video, 90% used lectures, and 79% used one-on-one instruction. SAS Institute's state-of-the-art video production facility is available if you are interested in developing custom video training.

Online Training or computer-based training is available through SAS Institute's SAS/TUTOR software, which makes interactive, self-paced training available as part of the SAS System. SAS/TUTOR software is economical and easy to use, and it can be used on a network. It includes feedback, guided practices, and quizzes. The built-in index feature makes it an excellent online reference.

In an article outlining the advantages and disadvantages of CBT, Adams (1993) says, "it takes longer and costs more to develop CBT than it does a classroom program, but the CBT course will cost less to deliver. CBT can be very efficient if you have a large number of learners in widely scattered locations -- but only if they have access to the hardware and software needed to run the program."

Criteria to Consider When Choosing Training

There are many questions to consider in choosing training on any subject. This is true for SAS training as well. Listed below are some questions you should consider as you decide the best SAS training solution for your circumstances.

Which Medium Is Most Effective?

Salomon (1978), in a review of research on the relative instructional effectiveness of various media, says,

- "One very important lesson we can learn is that all media can instruct, and that learners can learn from virtually all media."
- "No single medium is likely to have properties that make it best for all purposes. When effectiveness of one medium is compared with another for instruction in any given subject, it is rare for significant differences to be found."
- "Most instructional functions can be performed by most media."

What Do Your Users Need to Learn?

One of the first things to ask is what do your users need to learn? Do they know nothing about the SAS System and just need to get started? Or, are they experienced using the SAS System and need to learn

- new skills for new job responsibilities?
- more advanced programming techniques?
- statistical analysis? beginning or advanced?
- applications development?
- a very specific narrowly defined subject?
- the features of a new release of the software, for one product, or the whole system?

What are your specific short-term and long-term learning objectives? Do all users need to learn the same things? Or, are there groups that need to learn different subjects?

What Do Your Users Already Know?

Before you can choose appropriate training, you need to consider what you or your users already know. If you find a course on the subject you are interested in, do you meet the prerequisites for the course? Or, do you need to take preliminary training? On what subject? What courses are available to give you the prerequisite training?

How Many Users Do You Have to Train?

The number of people you have to train at any particular time can make a big difference in how you choose to get that training. If you have

- just one person needing the training, sending them to a public course and/or buying a video tutorial on the subject would be the most likely choices.
- 2 or 3 users who need training and you have similar numbers each month, you could consider waiting until 10-20 users are ready for a course and arrange one on-site course, or you could consider self-paced online or video training.
- 10-20 people ready for the same training all at the same time, an on-site course seems to be the obvious choice, but you could also show a video course in a classroom setting with a facilitator to help in computer workshops
- hundreds of users to train, on-site courses can become expensive quickly. Even if you use a Trainer's Kit and have your own instructor, staff expenses would mount up. Online or video training would be the most economical for large numbers of users.

Where Are Your Users?

If all your users who need training are in one location, then any medium would work. If they are located at several geographically dispersed locations, and they have access to a central computer or network, online training software would make a good choice. Video training would also work if you send the tape(s) from location to location or have acquired several copies.

How Is Your Response Time?

If response time is slow on your system, avoid online training. Otherwise, any medium is appropriate, although even computer workshops in an on-site course can be affected if response time is extremely slow.

Do You Need to Supplement/Customize the Training?

Many companies supplement training they get from vendors with information related to their workplace. Ussery (1991) describes an example of a company that supplements video training with site-specific information developed by the training coordinator.

While you can supplement almost any kind of training, whether you need to customize the training can affect what medium you choose. Video and online training are hardest to customize, with on-site IBT and Trainer's Kits being the easiest. Repole (1993) describes several ways to customize instructor-based training to include just the topics you need covered, using industry-specific data and applications.

How Soon Do You Need the Training?

If you need the training right away, this may eliminate the option of customizing training. If you're not in a hurry, any option would work.

If some users need the training now and others later, you could consider public courses or self-paced training, depending on the total number of users to train.

How Much Time Do Your Users Have for Training?

As Ussery (1991) points out, instructor-based courses "are typically delivered in two to five full days of instruction. With self-paced courses, trainees typically complete one to two hours of instruction per day over several days (or perhaps a week or two). Consider whether it is better for trainees to be away from their jobs for several consecutive days or for shorter periods of time over longer periods."

Which is better? For their learning? For getting their jobs done? Which is more important?

Where Will the Training Take Place?

The location of the training can impact the effectiveness of the training, the employees' ability to keep up with their regular work, and the cost of the training.

If you hold a class

- at your workplace, students may be tempted to go back to their offices during breaks. This gives them the convenience of being able to keep up with some of their work, but they may also get sidetracked from the training.
- at another nearby location, students are less likely to get sidetracked.
- at an out-of-town location, students are much less likely to get sidetracked, although they may still need to call the office periodically. However, with this option, your company will have to pay the expenses: transportation, food, lodging, and so on.

Do You Have an Ongoing Need for Training?

If you have 20 students needing the same training every month, you could choose any option, although public IBT would be expensive. If you have 2 students per month, every month, you could

- hold an on-site course twice a year, but some students might have a long wait for training
- consider self-paced training so students could take advantage of it while they need it without any wait.

Do You Have a Professional Trainer on Staff?

If you have a professional trainer on staff who knows enough about SAS software to teach your users, your best approach would be to use a SAS Trainer's Kit or develop your own training materials. Your trainer could also use video courses in a classroom setting and assist students with computer exercises.

Should You Develop Your Own Training Materials?

First you need to have someone on staff who is capable of developing quality instructional materials and who has the expertise in the subject matter, the communication skills, and the instructional design talents to develop a course. Plus, it takes time, whether the course designer develops IBT, video, or online training material or takes some other approach.

As Ussery (1991) indicates, "developing your own training materials allows you to tailor them to the specific needs of your users, using examples based on familiar data, but it is time-consuming and costly." Ussery and Allen (1992) estimated the cost of developing a 3-day course to be between $2,145 and $8,580 just for the time of one person who has a $30,000 salary. The estimate was based on the course taking between 150 and 600 hours to develop. If you develop IBT training, you would also need to factor in the cost of printing materials and producing overhead transparencies or other training materials.

Also, remember that you'll need to update your training materials as new releases of the software become available.

What Is Your Training Budget?

Your training budget can be a big determinant in your choice of training. Marrelli (1993) describes how to do a thorough cost analysis for training. Ussery and Allen (1992) compare the relative cost of various training media for training 15 students and found that self-paced training such a computer-based and video training costs less per student than public seminars, on-site instructor-based training, or Trainer's Kits.

Do Your Users Prefer a Particular Medium?

If you know that your users are not receptive to a particular medium, then even if it is the most economical and as effective as any other, you may have trouble getting them to use it.

Either choose a medium you know they will use or plan to spend time showing them how effective the medium can be.

Are the subjects you need available in the medium you prefer? It may be that you prefer video, but you need training in a subject that is not available in a video format.

What Level of User Control Do You Want?

Do you want your users to be able to take training whenever and wherever they find it convenient? Would you like users to acquire the training at their own pace rather than keeping up with a group? If so, self-paced training such as video and computer-based training are ideal. Ussery and Allen (1992) indicate circumstances when self-paced training is best, and they address common objections to self-paced training.

Keep in mind that video is the only medium that users can take home with them if there is no time available for training at work.

How Do You Determine the Quality of Training?

Given that SAS training is available from a variety of sources, how do you determine the quality of the training? Before you make a commitment to training, you should evaluate it. Ussery (1991) lists criteria to consider during the evaluation of a training product, even before students have used the training. Certainly, once students have had the training, you should ask them to evaluate it. Brinsfield and Livingston (1991) outline various techniques for evaluating training as it is being developed and after it has been used.

Mixing Media

After reviewing the types of training available and considering the criteria above, most people looking for a training solution find that mixing several media makes the most sense. Often, the best training solution for an organization, or even for an individual, is not to pick one particular medium but to use a mix of several media.

You can plan a successful SAS training program by mixing and matching training from different media. For example, students who complete the Fundamentals of the SAS System course, held publicly or on-site, can further their skills with SAS/TUTOR online training or video courses.

You could take the Fundamentals course in any medium and follow it with more advanced DATA step programming in IBT, CBT, or video format.

Brinsfield and Livingston (1991) suggest using online training or video training "to bring learners to a common baseline so that you will have a homogeneous group for an instructor-based course". Use videos as refreshers for users who want reinforcement of skills learned earlier. For example, use the video tutorial "Getting Started with the REPORT Procedure" as a preview for the SAS Report Writing IBT course, or as a review if you don't have time to apply the skills right away. Video and online training, because they are self-paced and modular, are excellent tools for reviewing concepts learned elsewhere.

Brinsfield and Livingston also suggest that you might want "to follow instructor-based training with video tutorials that expand on areas touched on in the course. For example, the SQL video tutorial could follow Fundamentals training to show more advanced methods for querying your data with PROC SQL."

It is common to combine public training and Trainer's Kits. Many organizations that use Trainer's Kits send the person who is going to present the training to one of the Institute's training centers to see how to present the material before presenting it themselves.

Examples of Companies Mixing Media

Video and IBT

One company needed to train 15 novice SAS users in the use of SAS software for basic statistics. The company had budget constraints, so they chose to combine a video course to introduce basic SAS concepts with an IBT course on statistics.

Video was chosen for three reasons. First, the material covered was concise. Second, some students expressed the desire to train individually on their own time. Third, the cost for licensing the video course quarterly was one-fifth the cost of an IBT course.

Video was greeted enthusiastically by both students and management because the video instruction, which preceded the IBT course, was tailored to meet the students' needs. The video course was broken down into manageable segments. Some preferred short periods of instruction followed immediately by computer exercises. Those familiar with SAS software preferred longer video segments. Both the SAS instructor and the company's training coordinator were impressed with the students' preparation for taking the IBT statistics course. In fact, the video segments on data and file manipulation were replayed as a refresher during the statistics course.

CBT and Trainer's Kit

Another company has a large base of SAS users. The company uses CBT with a company instructor who is knowledgeable of the SAS System. This company also uses Trainer's Kits heavily. They change the materials and exercises to accommodate the users' specific job tasks. The IBT course using the Trainer's Kit is followed by the CBT courses for reinforcement and remedial training. The instructors particularly like to use CBT as a review tool when the IBT course spreads over several weeks. Also, CBT is used to introduce users to SAS software. All new users go through the CBT before the IBT course. The instructors feel they could not do without the CBT courses.

CBT, Trainer's Kit, and Video

A third company is just beginning to use the SAS System. The company has a training department with a professional trainer experienced with SAS software. The company is training several users, experienced as well as novice, in the capabilities of SAS software. The company uses CBT to prepare the users for the instructor-based experience, which uses Trainer's Kits developed by SAS Institute. Once users have been through the CBT and instructor-based training, they attend video tutorial sessions that cover specific areas of SAS software. These video tutorials are shown every other week. The one-hour video precedes an open discussion. Supplemental training materials on the subject are distributed. The students use the supplemental materials back at their offices to apply the skills, knowledge, or concepts just learned. The users also may review the video tutorial at their leisure.

CBT and Video

A final example deals with a company that needed to train 80 Cobol programmers to use the SAS System for report writing. Before they could take report writing training, they wanted to get fundamental concepts and basic SAS programming training, but the company also had budget constraints. After evaluating various media, the company decided to start their users with CBT. The primary reason for choosing CBT to start was management's desire to train all 80 Cobol programmers at the same time in the fundamentals while the programmmers still continued their daily work assignments. Each person was required to allocate part of the work day to the CBT, based on their own time and job requirements. This allowed the programmers to be productive in their current responsibilities and also get the first part of their training done at their convenience. The CBT training was completed in two weeks.

The second part of the training was in programming. The 80 programmers separated into four groups. Over the course of five one-half-day sessions in a two-week time frame, each completed the programming video course. The video course was facilitated by an experienced SAS person from the company who, after segments of the video, answered questions and helped with the computer exercises. This worked extremely well for the students as they got precise delivery of materials in a fast-paced, visually exciting atmosphere. And with the facilitator, the students got the professional guidance and feedback that is so important and effective for understanding. After combining the CBT and video training, the programmers are now ready to learn report writing.

What to Consider for the Future

As you plan today's or next year's training solution, keep in mind that the world is changing and options for providing training are changing as well.

SAS Institute has started to include online tutorials in some of its products with SAS/EIS® and SAS/ASSIST® software being the first. More of these are planned for the future.

Dublin (1993) says "The burgeoning area of integrated performance support systems (IPSS) is helping to make learning on the job easier. IPSSs are a combination of computer systems (in which learning, advice, guidance, and support are embedded into an application itself or are accessible from the application at any time)." The Education Division at SAS Institute is working with other departments to develop prototype IPSSs for the SAS System.

With on-demand printing and custom publishing becoming more common, customizing course materials will be quicker and easier.

Teleconferencing is becoming more common. Consider a public SAS class with the instructor at SAS Institute in Cary and the students in their own work places, all able to interact.

Multimedia is one of the latest buzz words, but we're already able to incorporate video into online training. As the telecommunications industry evolves, combining interactive online training and video, with a button you push to ask a live instructor a question, is likely to be part of our future.

Conclusion

You can decide how best to get training on SAS software by considering the information in this paper. Most individuals and most organizations find they need a combination of types of training to meet all their needs. Contact the Education Division at SAS Institute if you would like help planning a custom SAS training program.

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