INTRODUCTION

The responsibility is yours! You have been asked to select training for a variety of SAS® software users at your site, and you have been told to keep costs down. You have taken a few SAS courses in the past and they were great. But now there are many more people at your site using SAS software in multiple ways, and you want to know what your options are, how to select the training that will be most cost effective, and how to evaluate whether you and your users have achieved the desired results. Where do you begin?

This paper provides some tools that you can use to select appropriate training for your site. The paper also discusses specific training options available from SAS Institute.

FIVE STEPS

When you complete the following five steps, you can increase your chances of selecting the most appropriate training for your SAS users:

1. Analyze your training needs and become aware of the training options that are available and when each may be appropriate.
2. Be informed when you talk to your education account representative so you can get the information you need about training.
3. Gather information about specific options by previewing materials or demos.
4. Prepare your students so the training they receive is appropriate and effective.
5. Develop or use existing tools to evaluate the effectiveness of the training you select.

Sound easy? It can be.

ANALYZING TRAINING NEEDS

First, you need to determine if a training need exists; second, who should receive the training; and third, what the training should include.

Is There a Need?

Begin by asking who requested the training? Consider actually writing down the answers to the following questions. Has an individual asked for training because new skills are required for the performance of his or her job? Has a new employee been hired who is unfamiliar with the software? Has a supervisor determined that an individual or group of employees now needs to learn a new skill in response to a request from management? Ask why the training is needed. Has a new system or product been installed? Often this is the catalyst for recognizing that a training need exists. For example, your site may have been running base SAS software in a mainframe, batch environment, and now you have Version 6 of the SAS System installed on MVS and OS/2® on a network with a whole variety of new products including SAS/ASSIST®, SAS/FSP®, SAS/GRAPH®, and SAS/AF® software.

In some unusual cases, there may not really be a training need at all. In some instances, people may just need access to resources, such as equipment and documentation. Sometimes other types of problems, involving discipline or morale, are mistakenly attributed to lack of training. A savvy training coordinator should be aware that, although rare, this can occur, so be on guard. By identifying the training need based on measurable standards or actual events, such as installing a new product, you can be confident that training is the appropriate action.

Who Is the Audience?

Once you have identified that a training need exists, that some condition exists that makes training necessary, you can identify your audience. In reality, at any given time, this can be multiple audiences: that is, different groups, with different training needs.

If you have multiple audiences, make a category for each and indicate how many are in each group needing the same training. Decide how often the training need will exist, whether it is occasional or ongoing.

For each group or each individual, ask questions such as:

• Who did the person requesting the training have in mind?
• Is this a new person coming in who has previous programming experience with other software, but no knowledge of SAS software?
• Is this trainee expected to use an existing SAS application, but with very little prior computer experience?
• Are there others using the software?
• Do you anticipate that others may use it in the future?
• If so, could they benefit from the same training?
• Are they familiar with their hardware and operating system?
• What versions of SAS software have they worked with?
• What products do they have experience with?

What Do They Have in Common?

Now as you look at the individuals in each training group, ask how homogeneous they are. Do they have the same basic knowledge? There may be individuals who need some prerequisite instruction to get up to speed before they receive training. Identify the skills that they need. For instance, do they need to become familiar with a new piece of hardware or operating system before SAS training is appropriate? Or are there those who have skills beyond the rest of the group and who may be bored quickly with a lot of review? Perhaps a modular course design that offers more learner control may be best for nonhomogeneous groups, allowing more experienced users to skip sections containing instruction for skills they already possess.
Once you have identified your training audience, determine exactly what you want them to be able to do after training is completed. To start, define a general goal. Then, with the input of the requesting management, if possible, identify specific learning objectives. Just “learning SAS” or “writing SAS programs” is too general.

For example, someone may need to read financial data into a SAS data set, produce ad hoc reports on selected data, and create color graphics showing changes over time. This person needs to understand how to get data into a SAS data set, possibly through a DATA step or through the FSEDIT or FSVIEW procedure of SAS/FSP software, how to query and subset data with the SOL or FSVIEW procedure, and how to produce plots with SAS/GRAF software.

On the other hand, someone may need to rewrite a Version 5 menu-driven application using the enhancements available with Version 6 Screen Control Language. Or an end user may need to use a new Version 6 data entry system and take advantage of WHERE clauses to search and subset data. The more specific you can be when identifying learning objectives, the better.

Also consider whether the trainee’s supervisors have any additional objectives in mind they would like to see as a result of the training. For example, is there a specific standard for the work, such as the speed at which the tasks are to be performed or an acceptable margin for errors?

Once you know who you need to train, what they need to learn, and what they already know, then you are ready to select a delivery system for training.

Selecting a Training Delivery System

Many experienced technical specialists and programmers want to understand broad concepts and rationales and relate new knowledge to existing knowledge. They want to learn techniques they can use or adapt to suit their purposes. These learners are quickly bored with redundancy or step-by-step instruction that does not fit into a larger context.

Some learners, on the other hand, want to learn specific tasks. They do not generally care about the big picture of how computers work or how information is processed. To them a computer is a tool, and they just want to make it work for them in a prescribed way. This learner may be a manager who wants to look quickly at an Executive Information System application designed to provide up-to-date statistics, a secretary who wants to pull a graphics report into a letter and print it, or even a beginning programmer.

When choosing a method of training, it is also helpful to consider:

- Does the student need to learn specific skills or overall concepts?
- Does the student prefer a private, self-paced learning environment, or a group, participative environment?
- Is the training an extension of current skills, or is it for a completely new area of expertise?
- How much control over the content and scope of the training do you want the trainee to have? Do you need to have a firm lesson structure, or is it appropriate for the learner to pick and choose which lessons or sections are desired?

These questions can help to begin your selection of the delivery method for the training.

What Resources Do You Have?

What is your training budget? You need to keep this in mind as you weigh training options. Getting the most people trained for your training dollar is usually a priority.

Over what time period can the training take place? Will your learners have some time each day that they can use for training, or will it be more convenient to take several days in a row for more intensive training?

Do you have a training facility at your site? For any kind of group training, this is a necessity. Is there equipment available for those who need to be trained? Are the learners familiar with the equipment? For example, if you choose a video course to be given in a group setting over several days, you will need a video player, a room large enough to accommodate your group, and computer equipment accessible to complete the computer exercises.

How many people do you want to train simultaneously or in a given time frame? You may not want to present the video training in a group setting; it may be more convenient to pass the training materials around and let learners complete the training on their own equipment as they have the time. Or you may want to select computer-based training if your learners all need training in the same time frame, but must take the training on their own equipment on different schedules. This is also a good option if the training need is going to be an ongoing priority, due to turnover or expansion.

WHAT ARE YOUR SAS INSTITUTE TRAINING OPTIONS?

SAS Institute offers a wide variety of training options in several media. Keep in mind that whatever delivery system you select, all Institute training follows the same standards for consistency of style and approach. The curriculum approach, coordinated across media, enables you to select training in SAS fundamentals in one medium and move to more advanced training in another medium without duplicating materials or missing important concepts that the advanced training builds on.

SAS Institute offers both self-paced and instructor-based training. Self-paced training includes computer-based training (CBT) and video-based training (VBT). Instructor-based training (IBT) is available in a variety of formats, including public courses, on-site courses, consortium training, and Trainer’s Kits.

Each medium also has specialized courses or tutorials that provide in-depth coverage of specific topics. Not all subjects are covered in every medium, so the course content in some circumstances may determine the delivery system. For example, SAS/ASSIST software and PROC SQL training are currently available in a video tutorial format. Instructor-based training includes a programming course and statistical training. Computer-based training offers both introductory and advanced concepts of base SAS, SAS/FSP, and SAS/GRAF software.

Most people tend to prefer one type of training over another. As the person responsible for selecting training, you need to know if one method is more effective than another.

It is important to be aware that the delivery system does not directly affect how well the learning objectives are met; it is the quality and structure of the training and how well the learner fits into the target audience that determines this.
Computer-based Training

Computer-based training is available on a broad range of topics from SAS Institute. Because CBT is self-contained, additional training support is not usually required. Learners can cover course materials at their own pace, usually in a familiar setting using their own equipment. One advantage to CBT from SAS Institute is that learners actually practice in the SAS environment, not a simulation, while they are taking the course.

Many research findings indicate that adult learners develop skills faster when they can control and self-direct their learning. The CBT developed at SAS Institute enables the learner to control the sequence and format to a higher degree than any other CBT for SAS programming skills on the market. Materials can be reviewed or repeated as necessary and the student can pause at any time during the instruction to practice the skills covered. CBT lends itself to step-by-step instruction because of its sequential flow. Because of the modular nature of most of SAS Institute's CBT, learners can take sections in any order or even skip sections that do not cover instruction of interest to them.

CBT from SAS Institute is carefully evaluated in terms of sound instructional design and content. In addition, though, the development of our CBT is subject to the same stringent standards as all of the other software products developed at the Institute. It goes through a scrupulous review and testing process that can typically take as long as a year from the initial planning stage to actual availability. Because of this, there may be a gap between the first appearance of a new product or software release and the CBT for it.

CBT can be very cost effective for large groups as there is really no limit to the numbers you can train with one course. CBT licensing arrangements bring in updates to current courses as soon as they are available.

To benefit the most from CBT, learners should be motivated to learn the covered materials and be able to work well independently. If you have an ongoing training need and differing skill levels for learners, CBT is a viable option.

Instructor-based Training

IBT has traditionally been the most popular training medium available from SAS Institute. Instructors go through extensive training themselves before they teach a course to the public. Instructors can answer questions and provide information on issues of specific interest to individual learners beyond the scope of the course. Generally, there are hands-on workshops to reinforce concepts introduced and explored in lecture sessions. Supporting documentation is provided in the form of Course Notes, which contain all of the overhead transparencies used by the instructor in the presentation of course material. Instructor-based courses are loaded with information, a lot of ground is covered quickly. Courses are continuously being revised and updated to include new information and to respond to students' reactions to course content and flow.

Consortium and on-site training are available as cost-effective ways to deliver instructor-based training. Both of these can be customized to some extent to fit the needs of the groups arranging the training. For those of you new to these training options, consortium training is a way for several SAS sites with similar training needs to get together to bring an instructor-based course to a convenient location. Training costs are shared by the groups. With on-site training, students can work in their own operating environments on objectives specific to their training needs.

Trainer's Kits are another way to provide training for your site. If you or someone at your company wants to teach a more site-specific version of one of SAS Institute's courses, you can use a SAS Trainer's Kit. This may include sending one person to a public offering of the desired course or providing that person with an instructor's guide. All the training materials used in the institute version of the course are included in a Trainer's Kit. One option for customizing the course would be to adapt the workshop exercises to use data and problems specific to your site.

Keep in mind when selecting instructor-based training that although some accommodation can be made for learners with varying skill levels, the most benefit will be gained by learners who have met the prerequisites and who are the target audience for the instruction. As these courses are dense in information and move quickly, there may be a problem absorbing all the information presented if students do not meet the prerequisites. Public courses are offered at scheduled times and require a block of time, usually two to three days, away from the job.

Video-based Training

Video-based training at SAS Institute comes in two formats: full-length courses and short tutorials.

Courses consist of a modular videotape and an instructional student workbook that includes computer exercises. A data tape that must be installed on the learner's operating system is included with the course. If this is done by a course coordinator, the student should be shown where the course files are located and be helped in getting started with the instruction. Some courses are sequential, and each segment builds on instruction in the last. Others are modular in design enabling learners to select topics of interest.

Tutorials differ in length and focus from courses. Limited topics are covered in short videotapes lasting under an hour. Tutorials are accompanied by handbooks that summarize the information in the videotape and point learners to other resources that provide additional information about the covered topic. 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. Hands-on practice is not included in a video tutorial.

Usually video-based training is delivered as self-paced instruction, where the student has the opportunity to review or skip segments as needed. VBT can also be used in a classroom setting. Learners who are more comfortable with supported instruction can benefit from this, especially when a course coordinator is present to answer questions as they come up. Licensing flexibility is available with VBT courses and tutorials are purchased outright. This can be a very cost-effective way to train a diverse group of learners in a variety of ways.

A Training Mix

The best solution for your site may be a training mix. Consider using CBT or VBT to bring learners to a common baseline so that you will have a homogeneous group for an instructor-based course. You may want to send one SAS expert to an instructor-based course, then use a SAS Trainer's Kit to adapt the training to your site.

Another option is 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. You can reinforce or review concepts covered in an instructor-based course with CBT or VBT courses or tutorials.
In addition, you might want to supplement the training with your own materials. For instance, after the completion of a video tutorial or a CBT course, you might have the students work through a case study that covers the learning objectives that you have identified. By developing your own case study or final exam, you can make the training relevant through data and exercises that are specific to your site. Many options are available to cover your training needs.

CONTACTING YOUR EDUCATION ACCOUNT REPRESENTATIVE

There are several options for getting information about training that is available from SAS Institute, including the semiannual issues of SAS Training regional user's group meetings, and the Publications Catalog. You can enroll in instructor-based courses by contacting course registrars directly.

When you have questions about your training options, your education account representative can be your best entry point for selecting training from SAS Institute. You can get information about course content and explore alternatives and options for getting the best training mix at your site. Their job is to know all the training options that are available and to try to match your needs with the best training solutions.

Account representatives are assigned by geographical areas and all are familiar with the whole range of training. You can reach your representative simply by indicating where you are calling from when you contact the Institute's Education Marketing and Sales Department. By the way, if you have any questions or concerns about the training you have already received, your representative can be your first contact.

Before you contact your account representative, you should gather some basic information. You may have much of this information already. Who is the audience? What is the current skill level? How many users are you trying to train for this skill level? Is this an immediate training need or one for the future? Is this an ongoing or one-time need? Do you have a training facility? This is important if you are interested in on-site or consortium training. If consortium training is your choice, are there any security issues to be considered for your system if multiple companies are to use your training facility? What would you like learners to be able to do at the completion of training? Once again, by doing your homework on the front end, you already should know the answers to most of these questions.

The account representative will have some additional questions. For instance, what version or versions of SAS software are installed? How many SAS users are at your site? What software products are installed? What operating environments exist at your site? What modes of execution are used? Do you have access to display manager or are you primarily batch users? The representative may ask for information regarding your budget concerns. The Institute wants to help you make the most cost-effective choices. If you have ever used Institute training before, perhaps you already have a preference, or perhaps you have comments about the quality. Be sure to let the account representative know; the Institute welcome your feedback and suggestions.

By having already conducted an analysis of your training needs and understanding who your audience is, you will be able to use your contact with your account representative to great advantage.

PREVIEWING DEMOS OR COURSE MATERIALS

Preview materials from SAS Institute include 30-day trials and demos from CBT courses, video demos showing clips of the content of video courses and tutorials, and Course Notes from instructor-based courses, which are available for purchase from the Book Sales Department.

Looking at course materials or previewing demos before you select training can help you determine if the course content and presentation is right for your learning group. By this time, you should have a clear picture of who your training audience is. Most training materials describe up front who the course is designed for and what learners taking the course need to know before beginning. Do your learners meet the prerequisites? How closely do your training objectives match those in the course? And if the training was requested by a member of management, see if you can arrange to include that manager in the preview.

Once you have the preview materials, review them critically. How is the information presented? Is it sequential or modular? How much learner control is appropriate? How much hands-on practice is provided? Do your learners just need an overview to get them started, or a more interactive and task-oriented approach? Is other training suggested to provide learners with the background to bring their skills up to the prerequisite level?

What level of language is used? Is it free of jargon and appropriate to the level of your learners? Are your learners comfortable with the delivery system? Will you need to make an extra effort to build support for the training process? Do you have all the necessary equipment to implement the training?

Look at the data and examples that are used in the training. Can your industry relate to them? Is it very important that the examples are relevant to your site's environment? Perhaps you can add your own examples, for instance, at the end of each lesson. Or perhaps it doesn't matter particularly. Again, by establishing whether a general, fundamental exposure is your goal, or whether you need single-concept, application-oriented specifics, you will be able to evaluate the materials according to your needs.

PREPARING YOUR AUDIENCE

Once you have selected the training that meets your needs, what's next? Before you provide the training, it is helpful to prepare your audience so that the training experience will be a positive one and produce the desired results. Make sure the learners meet the prerequisites. If not, help learners upgrade their skills so they feel comfortable with the level of the training.

If they are traveling to a training center, make sure students are comfortable with the arrangements. For on-site courses, facilities should be prepared in advance and students should be comfortable with the amount of time they will spend in the classroom.

Do learners understand why they are taking this particular training? Let them know what outcome is expected when the training is completed. Sometimes training can be threatening, especially when people are comfortable with the old way of doing things. Take extra time to ensure that the training is perceived as a positive, growth-oriented experience. Go over the training objectives and explain how the training can improve their jobs.

Is the necessary equipment available and familiar to learners? Do they know how to run the video player if they are taking a video course? Do they know where the video player is located? Is it clear when the training is to take place and what they should do if they are unable to attend scheduled training? Go over these issues with learners before the training begins.

Do learners know where to go for help if there is a problem with the training or if they do not understand what is expected of them? Is there any resistance to the training delivery method that might
obstruct learning? Maybe they had a negative experience with CBT once and do not want to give it a second chance. Talk to them about their concerns and reassure them about the quality of the training. Are your learners sufficiently motivated to move through self-paced training? It takes discipline to set aside the time and do all the exercises included in self-paced instruction.

Make sure adequate time is allowed for learners to complete the training. Take the training yourself so that you know what is involved. If improved performance at the end of training can lead to promotion or increased responsibilities, let learners know what is at stake.

EVALUATION TECHNIQUES

Your group of learners has completed the training you have chosen. Now what? How do you know that they have learned anything? This is another instance where establishing concise training objectives at the very beginning pays off later. You should know exactly what your intended objectives were. Now your task is to evaluate to what extent they were met.

There are several different types of evaluation processes. The first is formative evaluation. This is what the course developer relied on when the training course was developed. The review process that all instruction developed at the Institute goes through is a thorough formative evaluation. Exercises are tested, instructional flow is checked, graphic aids examined to see if they are appropriate and effective, language is evaluated for appropriateness and consistency, and the appearance of all course materials is carefully monitored. Unless you are developing your own training, you probably do not need to be concerned with formative evaluation.

The second, summative evaluation, is usually a tool or instrument that measures how well training has achieved its objectives. Pre- and post-tests, such as those used with video courses when they are test-taught, are a type of summative evaluation. The CBT Course Management System also provides this type of evaluation. Beginning with Release 6.06 of the SAS System, the CBT Course Management System enables you to set a mastery level for course quizzes. You can set that level based on the course, the site, the division, the training group, or on the individual student level. You can track the number of times the course was accessed by the learner, the first and last dates each student ID accessed the course, the total time each student spent in the course, and the lessons and sections that were completed.

If you want to develop summative evaluation on your own, some tools you might choose include questionnaires and pre- and post-tests. For on-site courses, you can use the evaluation forms that are provided at the end of the training. You can use course objectives to create questions that learners answer both before and after completing the training. This does several things for you. You can see how closely your learners match the audience the training is designed for and you can measure their mastery of the objectives. You can analyze the results and get a good idea if the training produced the learning results you wanted.

The third, transfer of learning, is the most difficult to evaluate. How much of what is learned in the training actually transfers to learner’s jobs? One way to determine this is to ask. Prepare a questionnaire, or even better, if your learners are in one location, ask them in person. How has the training improved their job performance or increased their productivity? Ask for specific examples if possible. Observe them directly or ask their managers if the training achieved the desired result. If there is a specific performance standard, you can compare their level of work before and after the training. If not, can they teach others the acquired skills? The ability to teach others usually indicates mastery.

SUMMARY

Choosing appropriate training can be fairly easy if you do some preparation. Remember,

• analyze your training needs first. Define the audience and set the training objectives before choosing training. Based on your audience and resources, choose the appropriate method or methods to deliver your training.

• talk to your account representative to get a training match. Often they can suggest cost-saving alternatives and options.

• get more information about what is available by previewing materials and demos. Look carefully at prerequisites and objectives.

• prepare your learners so the training they receive will have positive results.

• evaluate training effectiveness. See how well learners have achieved training objectives, and how well their skills transfer to their jobs.

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