IT Training: Can Distance Learning Be Effective?
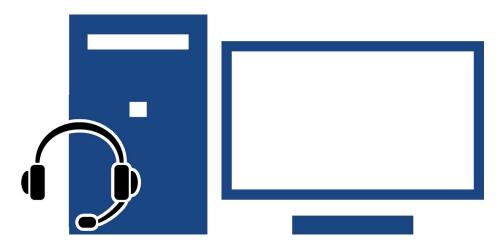
How Remote Attendance Surpasses E-Learning and Virtual Classrooms
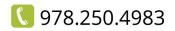
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Introduction

As companies seek ways to train their employees in complex IT subjects without leaving the workplace, the option of online training is an appealing idea. Although the most effective solution for technical training is to have a subject matter expert instruct students in a structured classroom setting with hands-on, facilitated labs, cost and availability can make it difficult to obtain such training. Also, it is difficult to provide cost-effective on-site training for a small number of students, while open-enrollment classes aren't always available locally.

E-learning and virtual training "webinars" offer the appeal of self-paced, "any time anywhere" instruction, but studies show that the reality is that students don't finish these kinds of programs. They work well for relatively small, simple skill updates – for example a 10 minute video updating a standard medical procedure for nurses. But for large, complex topics like computer programming or system administration, a structured environment and live facilitation of hands-on practice are almost always required to assure timely completion, successful learning, and retention.

Given these constraints, the ideal solution is to participate in a live training event with the benefits of the social interaction (which boosts achievement during class and retention after class), real-time instructor facilitation, and the opportunity to ask questions – but without spending the time and money required to travel to distant training sites. SST's Remote Attendance option provides this solution, unlike other online methods such as e-learning, webinars and other virtual online training events.

This document will explain how SST's Remote Attendance option overcomes the shortcomings of e-learning and virtual classrooms in order to provide an effective and enjoyable classroom learning experience.

Guaranteed

Small Class Sizes

Quality Instructors

Competence

Cost-Effective

The Shortcomings of E-Learning in the IT Training Environment

E-learning can provide adequate training for simple subjects or tasks. A 20 minute online video followed by a few comprehension questions or a practical exercise can work well for small, discrete topics.   But for complex goals like learning a programming framework or how to administer an operating system, e-learning is simply not an effective learning method.

E-learning courses are self-paced experiences, with students reading through slides, watching lecture videos, or following along with a step-by-step demo video. Exercises afterwards are completed by the student on their own. If they have trouble completing a lab exercise, at best they may be able to email or text chat with a learning assistant to get assistance. Exercises are necessarily either simple, or consist of step-by-step instructions that tell the student every single thing that needs to be done, not requiring the students to think for themselves. E-learning practice exercises have to be structured this way, because the exercises need to be completed without real-time facilitation.

To overcome this shortcoming, instructors may be made available at designated times for Q&A sessions, or may be contacted via web chat or e-mail or other communication mechanisms. Of course, this help is not necessarily available when the student needs it, say, at 8 PM local time. This technique, called "blended learning," is a well-intentioned attempt to inject some of the advantages of face-to-face instruction into the e-learning experience, but it just isn't effective. The reason isn't logistical – the challenges of providing timely responses, full duplex discussions, group interaction and so on. **The fundamental reason that self-paced e-learning doesn't work is that the vast majority of students never finish courses of instruction in complex topics.**

Studies show that the major factors limiting the effectiveness of e-learning as a delivery mechanism for IT training are the lack of social interaction and difficulty in motivating students to complete the material on their own. Any cognitive psychologist will affirm that social interaction increases retention dramatically. Additionally, complex exercises necessary for in-depth IT training have proven difficult if not impossible to implement successfully in an e-learning environment, even with blended learning components. Educational psychologist William Glasser, for example, summarizes that we learn and remember:

- ▶ 10% of what we read
- ▶ 20% of what we hear
- ▶ 30% of what we see
- ▶ 50% of what we see and hear
- ▶ 70% of what we discuss with others
- ▶ 80% of what we experience or practice

The lack of social interaction in e-learning classes doesn't just create a learning environment that is dull for students, it decreases the ability of students to retain what they learn. Studies show that even students who complete the training perform at a lower level of productivity and are less successful in advancing their personal careers than students who attend live classes. Some of the reasons are that questions (and their answers) cannot be asked in real-time as the student progresses through the training materials; topics of interest cannot be discussed more in-depth when a student wishes to find out more about something; and different ideas or perspectives do not pop up because students are isolated from each other. It's no mystery why students have such difficulty in completing e-learning courses – it's a boring learning experience that students rarely can motivate themselves to complete. Combined with the temptation to postpone the next self-paced module in order to deal with more time-critical issues, completion rates are abysmal.

When a student encounters a problem preventing them from being able to complete a lab exercise – a common occurrence in IT training – they have to either type up an email to describe their problem and wait for a response (hoping they don't have to wait too long for a response), or communicate their problem through an instant message chat client (which can be very cumbersome for complex issues or topics). This kind of an interruption and delay in the completion of exercises is disruptive to time scheduled by the student for e-learning, and hinders the retention of material in general – starting an exercise, and then having to break off and come back.

Training Comparison Chart – E-Learning vs. Instructor-Led

The shortcomings of self-paced e-learning are numerous and apparent when compared to instructor-led live training. This chart identifies these problems.

E-Learning	Desired Attributes	Instructor-Led, Hands On Training
Competence not assured; online tests primary assessment mechanism	*Guaranteed development of competency*	Competence can be tracked and assured via completion of hands-on practice and instructor assessment
Learning responsibility rests with user	*Learning responsibility rests with both student and supervisor*	Supervisor and student both responsible for learning
Learner's experience is uninspiring; "lowest common denominator"	*Individualized experience*	Stimulating, individualized experience (if small class size)
Feedback to user low; live feedback, if available, is delayed	*Feedback to user should be timely, clear and complete*	Feedback occurs in real time as learning occurs; feedback is focused to user's concerns
Lacking time constraints and formal structure. Completion rate low.	*Structured and motivating atmosphere; high completion rates*	Structure and motivation provided. Social interaction among students and instructor keeps students interested in course. Completion virtually guaranteed.
Instruction quality level is consistent but low	*Quality instruction each delivery*	Instruction quality varies but can be set to a high baseline
Practice difficult to simulate inline with presentation; little or no supervision of separate hands-on practice	*Supervised hands-on practice performed in sequence with the training*	Supervised hands-on practice at natural sequence points, both within presentations and during lab sessions
Retention poor to fair, depending on quality of video materials, reading materials, presentation style, and lab exercises	*High retention of material*	Interactive discussion, hands on practice labs and social interaction produce high retention

Virtual Classrooms vs. Remote Attendance of a Face-to-Face Class

Clearly, e-learning is generally not a desirable solution for IT training focused on ensuring competence. As a result, training providers have sought to fill the online training gap with instructor-led virtual classrooms. In these virtual classrooms, instruction is provided through presentation slides shared on the students' computer screens, and sometimes a live video feed of the instructor himself, allowing students to see the instructor's expressions and body language. Students generally have full duplex audio available between themselves and the instructor, although in some cases students must get instructor approval to speak. During lab portions of class, students complete hands-on exercises on their own, asking for instructor assistance when needed; the instructor is able to see the student's lab machine screen to see what they are doing, and in some cases the instructor can control the lab machine himself.

This is certainly a step forward from e-learning. Many problems with e-learning are addressed with virtual classrooms: class is structured so it is completed in a timely manner, feedback to students is real-time, a good instructor can motivate students to stay focused during class, and there is some social interaction between students and the instructor. However, with the virtual classroom offerings currently on the market, social interaction between students themselves is still lackluster, and students still can find their minds wandering during class due to dry, largely canned, non-interactive presentations.

SST's Remote Attendance option connects students to a live classroom that includes a face-to-face mix of in-person and remote students. It provides the following advantages:

- ▶ Social interaction is easy and natural, with remote attendees benefiting from the discussion of live questions, alternative exercise solutions, and insights from seminar participants.
- ▶ The live learning environment keeps remote students involved in the same way as in-person attendees for the entirety of class.
- ▶ Hands-on exercises are robust and include the same challenging assignments as for in-person attendees, with immediate help equally available to in-person and remote students.
- ▶ The presentation is not canned; remote attendees have the same ability to guide discussions and ask questions as in-person participants.

Along with the obvious requirement of quality video and audio feeds, SST structures the learning environment to provide a superior experience for remote attendees. For instance, one major difference in class delivery between SST and competitors is that SST does not use online PowerPoint slides in its classes. SST ships hardcopy, professionally bound courseware to every student, allowing them to easily highlight important points, add notes, flip back and forth, and use for subsequent reference (as during hands on exercises). Online PowerPoint slides can be incredibly difficult to pay attention to over an entire day, and often cause students to lose interest and do unrelated tasks during class.

SST provides dynamic video capability that is absent from webinars and virtual classroom presentations. Remote students are provided two video feeds of the actual live classroom. One of the video feeds is a webcam at the front of the room near the instructor, to provide a close view of the instructor while he/she is lecturing or providing assistance. The other camera is a Pan-Tilt-Zoom camera placed at the back of the classroom, which is controllable by remote students, allowing them to look at whatever they want in the classroom. Remote attendees can use it to get a wide view of the entire physical classroom, or to zoom in on the classroom whiteboard to get a clear, crisp view of the instructor's writing. It can be panned and zoomed as desired to observe in-person students and the instructor during lab sessions. The ability to control a camera in the classroom allows students to stay engaged during class, since they can dynamically view different areas of the classroom, as the points of interest shift.

Competitive offerings of virtual classroom events often have duplex audio between remote students and the instructor, and there is usually a PowerPoint presentation. However, what is missing in most of these virtual classroom presentations is the ability of the remote students to send their own video feeds in to the instructor. SST's remote attendance software allows the instructor to see remote students' faces, and also allows remote students to see each other, as well as the in-person attendees. This allows for much more natural and effective communication between all parties in class, allowing everyone's expressions and body language to be seen. Additionally, because the instructor can see the remote students, he knows when students are and are not paying attention, and thus can determine appropriate times to check in with the students or ask them questions to keep them attentive during class.

In most virtual classroom events, the instructors have the ability to connect to and control student lab machines to provide exercise assistance, but students in such classes do not connect to each other's lab machines to work together. However, students taking a SST class remotely are encouraged to work together, and have the ability to connect to each others' lab machines when desired, so students can bounce ideas off each other and collaborate to finish complex labs more quickly. This allows students to learn from each other, just as in the physical classroom, and allows more material to be covered with better retention.

In virtual classroom experiences from most training providers, the instructor controls the volume of class attendees, and also the positioning and size of the video feeds in class. In some cases, students must be given permission to speak before the class can hear them. With SST's remote attendance option, students are fully in control of who they see, and the volume levels they hear. Students can share their thoughts with the class whenever they wish, and likewise, students may decrease the volume or mute out other participants whenever they wish. If students wish to have a wider view of the main video feed, they are free to enlarge it. If students want to shrink or even completely close out other students' video feeds, they can do that too. (This is an especially useful feature for remote students with low Internet bandwidth, since they can reduce the amount of active video feeds to conserve bandwidth usage.)

A significant advantage of all SST classes, including those attended remotely, is the small class size. A smaller class means the instructor can devote more time to focusing discussion to meet individual students' interests, and also ensures that the instructor has adequate time to properly assist all students during the hands-on lab exercises. SST's class sizes are typically between 4 to 10 students total, whereas "virtual classroom" events are typically larger and less interactive.

SST's audio/video equipment used to enable remote attendance is quite portable, and this allows SST instructors to easily set up for remote attendance at a client's site. For example, if a company wants onsite training in their New York facility, but they have two employees in Los Angeles who cannot travel to New York for the training, SST would be able to set up the necessary A/V equipment in the New York classroom and allow the two Los Angeles students to remotely attend the course being held in New York.

The combination of physical courseware and robust lab exercises, multiple video feeds from the classroom, and the ability of the instructor to see and react to remote students during class all combine together to allow for a satisfying and effective remote attendance experience for students. Remote students are able to stay focused and interested on the subject matter, because they are able to easily and quickly communicate with the instructor and other students, and get real-time assistance from each other and the instructor during hands-on lab exercises.

Training Comparison Chart - Virtual Classroom vs. Remote Attendance

Virtual Classrooms	Desired Attributes	SST's Remote Attendance Option
Online slides, and live video & audio	*Quality content delivery*	Student has hardcopy guides, live video and audio
Full Duplex audio available, but students cannot send their own video to other students or instructor. Students can see live video of instructor, but cannot control the video camera.	*Robust audio/video capability for an ideal learning and social environment*	Full Duplex audio available, and students can send their own video feed to the meeting. Students can see live video of instructor, and can control one of the cameras in the classroom.
Feedback occurs in real time as learning occurs; instructor can see and control student's lab machine	*Feedback to student should be clear and complete*	Feedback occurs in real time as learning occurs; instructor can see and control student's lab machine
Instructor cannot see student's video feed, and thus does not actually know if student is paying attention during class	*Class instructor ensures that students are staying engaged during class*	Instructor can see student's video feed, to see if they are paying attention during class lecture
Stimulating, individualized experience possible (if small class size). Class sizes are typically at least 12 students total	*Individualized experience*	Stimulating, individualized experience possible (if small class size). Class sizes are typically between 4 – 10 students total
Students do not connect to each other's lab machines	*Students can collaborate to share ideas during labs and complete them more quickly*	Students are encouraged to assist each other during labs, and can connect to each other's lab machines
Instructor controls volume levels of participants. Instructor controls video sizes displayed to all meeting participants.	*High level of student control over volume and video feeds*	Each student can control the volume at which they hear each other user. Students can resize any video window they see, and close out windows they do not wish to see

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Don't Just Take SST's Word for it

Students who have been disappointed by some form of e-learning or virtual classroom training in the past may have a healthy skepticism about online distance learning. Comments from students who've attended SST classes using the Remote Attendance option help provide useful insight into the experience:

"I absolutely loved the training and the remote attendance. The instructor was great! I was hesitant to do remote attendance. It exceeded my expectations. It was like I was sitting in the back row. So much more convenient than traveling."
– K.C., IBM Global Services

"Instructor was very attentive to me as a remote student. Best remote class I have attended so far and I have attended a lot of remote courses from Learning Tree etc."
– S.C., TCU

"The remote class worked very smoothly. The experience far exceeded my expectations."
– A.R., General Dynamics

"Taking the class remotely worked out really well. The equipment provided and the thorough checkout of it was really smooth. I did not feel that I missed anything at all because I was taking the class remotely. Several of the students traveled to California for the class and I really don't think their travel costs were worth it given that I think I got just as much out of the class remotely. I would suggest you push that more as a viable option."
– J.Y., General Dynamics

"I was very skeptical of remote classes and feel that online classes have very little value. I thought this would be like an online class, but the remote experience was much better than an online class."
– L.P., Beckman Coulter

"I greatly enjoyed this course! This was the best training course I've taken for the past few years. I liked and it was beneficial for me that this course was connected to the actual classroom. I was a remote student, but it felt like I was in the classroom and this helped me to be connected and more efficient. I appreciate that actual hardcopy study materials (books, labs...) were sent to me! I will definitely recommend your company to others who are interested in taking professional courses. Thanks a lot for the great job!"
– A.V., ERIN Engineering and Research