BEST PRACTICES WHITE PAPER

Blended Learning for Software Professionals

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Instructor led technical training continues to provide the highest quality training experience, but advances in online eLearning are narrowing the quality gap between Instructor Led Training and eLearning. The choice of training modalities does not have to be an either/or choice. Properly structured, Blended Learning can provide the high-bandwidth, in-depth, focused interactions of instructor led training combined with the low cost and world-wide, on-demand availability of online eLearning. This white paper examines the strengths and weaknesses of Instructor Led Training and eLearning and presents scenarios that are well-served by a Blended Learning approach.

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History of Professional Training

For decades the gold standard for adult education has been classroom instruction with a subject matter expert who is also a skilled trainer. This is known as Instructor Led Training or ILT.

CBT

Companies began experimenting with Computer Based Training (CBT) as early as the 1980s. CBT offerings were distributed on disks and accessed via desktop computers. CBT offerings from the 1980s through the early 2000s were crude and not engaging for learners, and so CBT came to be used primarily for compliance training rather than for development of more advanced skills such as Agile software development practices, software requirements practices, or similar high-skill practices.

Synchronous Online Learning

With widespread adoption of the internet circa 2000, Online Learning became a possibility. Early forays into online learning focused on Synchronous eLearning in which a live instructor and learners interacted in real time via conferencing tools such as WebEx, GoToMeeting, and similar services. Synchronous eLearning reduced travel time and expense. Students could ask questions, to a point, but the experience consisted almost entirely of low fidelity versions of classroom communication, interaction, and feedback without adding anything to take advantage of online capabilities—which resulted in an experience that combined many of the worst attributes of ILT and CBT.

Asynchronous Online Learning

In the early 2010s, advances in eLearning content creation tools combined with cost-effective video production tools made creation of Asynchronous eLearning practical. In Asynchronous eLearning, content can be developed, recorded, and delivered with high quality. Some asynchronous eLearning offerings are just a voice recorded over a PowerPoint presentation or a webcam recording of a speaker in his office. But other Asynchronous eLearning developers have invested significant time and resources in creation of content and have created rich learning experiences for the learner. In other words, quality of current Asynchronous eLearning offerings varies enormously, but the top-end Asynchronous offerings are much better than the top end offerings in older-style CBT or Synchronous training.

Today's Two Leading Learning Delivery Options

As of today, the two leading learning delivery options are ILT and Asynchronous eLearning. (Asynchronous eLearning which will be referred to simply as "eLearning" for the remainder of this paper).

ILT

ILT has the advantages of rich in-person communication, including the opportunity for the instructor to read body language and provide instant feedback. It is a socially enjoyable experience for many learners, and a skilled instructor can leverage group synergies to maximize the value of the training.

ILT has the disadvantages of requiring travel for the learners, the instructor, or both. Quality can be highly variable depending on the skill of the instructor. Cost of finding a true subject matter expert who is also a skilled instructor can be high. Some software professionals do not prefer a classroom learning experience. Finding a time when all learners are able to participate presents challenges for scheduling ILT classes, especially for companies with software staff at multiple sites.

Despite these challenges, ILT remains the gold standard, and *CLO Magazine* reports that ILT is still by far the most common form of training delivery.

eLearning

eLearning has the advantages of low cost, on-demand availability, learner control of the pace and amount of learning consumed at any one time, and the ability to reach a large audience quickly and consistently. Much discussion about eLearning focuses on cost, but at least one study found the most significant appeal of eLearning was the convenience offered by always-available, on-demand, self-paced training.

eLearning has the disadvantages of minimal or no interactivity with the instructor or between learners; and little or no adaptation to the needs of specific companies. Quality of current eLearning is highly variable and ranges from recorded webinars and web conference sessions to high quality, professionally produced audio and video.

Despite a few disadvantages, *CLO Magazine* reports that self-paced eLearning is the fastest growing category of training delivery, that it has been the fastest growing delivery method for the past few years, and that it is expected to continue being the fastest growing delivery method.

Table 1 summarizes the strengths and weaknesses of ILT and eLearning.

Table 1 *Summary of ILT and eLearning Attributes*

Attribute	Instructor Led	eLearning
Supports rich non-verbal communication (body language)	✓	
Rich interactions with other learners and group synergies	✓	
Live instructor feedback on exercises	✓	
Free from desktop distractions (emails, etc.)	✓	
Material can be adapted for specific companies	✓	✓
Interactive exercises	✓	✓
No travel required for the learner	✓	✓
Easily rolled out to distributed locations		✓
Supports widespread rollout to all learners simultaneously		✓
Supports frequent, short learning sessions		✓
Accessible to learners who are uncomfortable in traditional classroom settings		✓
Pace of learning is set by the learner		✓
Learner can skip material that isn't relevant		✓
Learner can pause material for lunch, breaks, etc.		✓
Learner can choose own path through material, including backing up and repeating missed material		✓
Learner can choose any time (lunchtime, evenings, etc.)		✓
Learner can choose any location (bus, train, gym, etc.)		✓
Learner can pursue specialized topics in depth		✓

A Third Learning Option: Blended Learning

A careful examination of Table 1 reveals that the strengths and weaknesses of ILT and eLearning are almost exact opposites. This presents an opportunity to combine the two learning delivery methods and leverage the best of each method. The combination of the two methods is known as Blended Learning.

Blended Learning for software professionals can be responsive to many common software industry training needs. The following sections describe some of the most common training-needs scenarios and how Blended Learning can provide effective solutions in these cases.

Scenario 1: Software Professional Staff Spread Across Numerous Sites

A company has grown by acquiring small companies and now has several sites that have 1-15 software professionals at each site. Many sites have too few staff to justify sending an ILT trainer to them, but the travel cost of bringing all team members together at one site for ILT is prohibitive.

Blended Learning Solution: Provide eLearning for consistency and ILT for deep dives. eLearning is provided to the entire staff, ensuring consistent training is delivered company-wide. ILT is provided at a central site to a hand-picked selection of leaders and other high potential staff who travel to the central site to participate in ILT. These staff members can also participate in other work with central office staff during that same trip to maximize the value of the travel time and expense.

Scenario 2: Attempts at in-House, SME-Based Training for Software Professionals Have not Been Well-Received

A company has previously provided training on software topics such as Scrum, Project Management, Requirements, and Estimation using in-house Subject Matter Experts (SMEs). Preparing for the classes has taken too much time away from the SME's primary jobs, and feedback scores on the classes have been mediocre at best. The company does not have the budget to bring in professional trainers, but it nonetheless still wants to find training that does not place excessive demands on its SMEs and will be better received by its software professionals.

Blended Learning Solution: Provide eLearning on topics such as Scrum, Project Management, Requirements, and Estimation. Have software staff take eLearning in 90 minute sessions in groups of 5-10 people. Spend the first 45 minutes viewing eLearning content. Spend the second 45 minutes discussing

how specifically the topics can be applied in this specific company. Have the coaches and SMEs available to contribute their expertise in these discussions.

This approach minimizes direct cost, eliminates SME preparation time, and still leverages the SME's expertise in a group training session. Additional ILT training can be provided as-needed to augment the SME's skills or provide additional training for leads or other high potential staff.

Scenario 2(a): Attempts at in-House Training Using a Well-Liked Agile Coach have not met Expectations

A company has experimented with providing training on Agile software topics using a local Agile coach. The coach is well liked and effective at coaching, but the more formal training has not met expectations. The company wants to continue to leverage the skills of the coach while finding a way to provide higher quality training.

Blended Learning Solution: Provide a solution similar to Scenario 2. Provide Agile eLearning to the software professional staff. Have software staff take the Agile eLearning in 90 minute sessions in groups of 5-10 people. The staff will spend the first 45 minutes viewing eLearning content. They will spend the second 45 minutes with the Agile coach discussing specific aspects of how the topics apply in this specific company.

Scenario 3: Maximizing the Company-Specific Value of an ILT Session

A department has budget for ILT and wants to ensure that maximum value is received for the time its software professionals spend in training.

Blended Learning Solution: Provide eLearning as preparation for the ILT course. Staff can participate in the eLearning version of the class 2-4 weeks prior to the ILT course. The eLearning covers fundamentals and general aspects of the training. Staff formulates a list of company-specific questions while taking the eLearning course. These questions are then addressed during the ILT course. As a result of the eLearning background, the ILT discussion becomes highly focused on the company's specific needs. The instructor in the ILT session can skip general material and concentrate on applying the course content to the company's specific issues.

Scenario 4: Large Software Staff, Limited Training Budget

A department has a large software staff and a limited training budget. The department recognizes the value of training its software staff but the company views training more as an "expense" than as an "investment," so the department must carefully justify its training expenses.

Blended Learning Solution: Provide cost-effective eLearning for the entire staff. Provide targeted ILT sessions to augment the eLearning for technical leaders and coaches. The result is consistent training for the whole staff plus more in-depth training for the thought leaders who exert the highest leverage on the organization. Depending on budget restrictions, the ILT sessions might be offered only in alternate years, while eLearning continues to be offered as a training backstop every year.

Scenario 5: Comprehensive Software Best Practices Training Program That's Cost-Effective and Minimizes Disruption

A company has found that most software professionals view training as a benefit, and it wants to provide comprehensive training to its software professionals to show its commitment to investing in them. The company believes that training investments support recruiting and retention in addition to professional development. However, the company wants to minimize staff disruption and maximize value received in return for the training investment.

Blended Learning Solution: Provide a comprehensive high quality Software Development Best Practices eLearning catalog for the technical staff so that anyone in the organization can access any technical training at any time. This allows staff to pursue their professional development on an as-needed basis. It allows staff to take advantage of down time opportunistically and pursue their own professional development as time permits throughout the year. It also allows staff to pursue professional development after hours on their own time and at their own pace.

The organization still provides ILT selectively, for targeted purposes, focusing on areas of strategic need, on identified weakness, or as skills enhancement for leads or other high potential staff.

Scenario 6: Providing Training to Software Staff Who Cannot Spend 2-5 Days in a Classroom at the Same Time

A company wants to provide training to its centrally-located staff. Due to vacation schedules, meeting schedules, and the need to support a production system, having the entire staff in training at one time is not desirable.

Blended Learning Solution: Apply the 80/20 rule: schedule the ILT training when 80% of the staff can attend the ILT class, and provide the eLearning version of the same course for all the target attendees—including those who attend the ILT and those who cannot. Staff who miss segments of the ILT training can backfill those parts by taking the eLearning. Staff who miss the ILT

training altogether can receive the entire course content via eLearning. This supports development of shared vocabulary and shared understanding even when certain staff members cannot be present for the ILT.

Scenario 7: Reinforcing ILT Training Over Time

A company is committed to offering ILT to its staff and wants to ensure the staff can continue to benefit from the training as time goes by. The possibility of recording the training session has been raised, but that will increase the cost of the training and be distracting to learners in the ILT session, and the company questions whether software professionals will actually make use of the comparatively low budget recording.

Blended Learning Solution: Schedule ILT sessions for all staff members, and provide the eLearning version of the class to the same learners for future reference. The eLearning version of the course will be much higher quality than a one-off video capture of a live course and can be provided at lower cost than capturing and producing a video of the live course.

Scenario 8: Level-Set Training for New Staff Members as They Come on Board

A company is growing rapidly and wants to ensure a common understanding of key software practices such as Scrum, Requirements, and Estimation. The company has tried using ILT offerings, but attendance has been low in some classes due to the irregular rate at which new software professionals are hired. As a result, ILT has not been a cost-effective solution in this scenario.

Blended Learning Solution: Provide a site license for eLearning content that can be accessed by new software staff as they come on board. This can be supplemented by an eLearning training plan such as, "New software staff members will take eLearning Modules for Scrum, Requirements, and Estimation within their first 30 days of employment." ILT classes can still be scheduled to meet staff needs on a targeted basis.

Scenario 9: Training a Mix of Advanced and Novice Staff

A company has a mix of staff who are more junior and more senior with respect to a particular topic (such as Scrum, Requirements, Project Management, Estimation, etc.). The company does not have the resources to provide both an introductory class and an advanced class. Yet, if only one class is chosen, the introductory class will not sufficiently challenge the advanced staff, while the advanced class would be beyond the capabilities of the novice staff.

Blended Learning Solution: Provide the eLearning version of the introductory class and the ILT version of the advanced class. Learners who are more junior will take the introductory eLearning class prior to taking the in-person, advanced ILT class. More advanced personnel who already understand the introductory content can skip the eLearning class and just take the advanced ILT class.

Scenario 10: Low-Cost Stop-Gap Training Preceding ILT

A department has already used most of its training budget for the year. It wants to provide ILT training in a key area of need, but it does not currently have the budget to do that. It will not have that budget until next year.

Blended Learning Solution: Provide eLearning as a low-cost measure to begin training in the current budget year. When ILT training is provided in the next budget year, that training can be much more focused and high leverage as a result of the groundwork that was laid by the eLearning the year before.

Supporting Successful Blended Learning

Blended Learning is easier described than done. Effective Blended Learning will meet several criteria.

- *The eLearning is Engaging.* The reason CBT came to be used mainly for compliance training was that it was not very engaging. eLearning provided for purposes of professional development should be professional and engaging enough to maintain learner's interest.
- *The eLearning is Credible.* Software professionals value expertise above all else. They want their eLearning to be presented by subject matter experts whose expertise will be recognized by the staff receiving the training.
- *The ILT is Engaging and Credible.* The same considerations apply to ILT. The largest cost of ILT is not the fee paid to the speaker; it is the staff cost of the 2-5 days the staff spends in training, plus any travel time involved. Good training will repay that investment many times over, whereas mediocre training wastes both money and time.
- *The eLearning and ILT are Technically Consistent.* Two of the most commonly reported benefits of technical training are "shared understanding" and "shared vocabulary." The success of Blended Learning depends on staff receiving training that is consistent across eLearning and ILT. This is easiest to accomplish when both ILT and eLearning are offered by the same vendor—or, even better—the same subject matter expert delivers both the eLearning and ILT.

Construx Blended Learning

Construx has been the industry leader in instructor led software training for almost 20 years. Since 2011 Construx has been investing heavily in eLearning versions of its popular ILT courses as well as new eLearning offerings. Today, Construx is uniquely equipped to provide best-in-class, state-of-the-art eLearning to complement its industry leading Instructor Led Training.

Construx offers Blended Learning in topics including:

- Scrum
- Scrum Product Owner
- Scaling Agile Projects
- Agile Requirements
- Traditional Requirements
- Software Estimation
- Software Construction / Code Complete
- Agile Developer Practices
- Design Patterns
- Risk Management
- Project Management
- 10x Software Engineering

This is a partial list, and new offerings are being added frequently.

Construx staff are employees, not contractors, so we are able to provide consistency across our ILT and eLearning offerings. In many instances we can provide an eLearning offering and ILT class with the same instructor. Our consultants are highly skilled in the classroom, and they are not just talking heads. All of our instructors have at least 20 years of software industry experience and are just as comfortable with one-on-one problem solving as they are in front of a camera.

Learn More about Blended Learning

- Sample Construx's eLearning offerings for free at https://cxlearn.com.
- Construx's instructor led offerings can be found at http://www.construx.com/seminars.
- Contact a Construx solutions consultant at seminars@construx.com.

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About Construx

Construx Software is the market leader in practical, research-based training and consulting that supports software professionals. Construx was founded in 1996 by Steve McConnell, respected author and thought leader on software development best practices. Steve's books *Code Complete*, *Software Estimation*, and other titles are some of the most accessible books on software development with more than a million copies in print in 20 languages. Steve's passion for advancing the art and science of software engineering is shared by Construx's team of seasoned consultants. Their depth of knowledge and expertise has helped hundreds of companies solve their software challenges by identifying and adopting practices that have been proven to produce high quality software faster and with greater predictability.

For more information about Construx's support for software development best practices, email us at consulting@construx.com or call us at +1(866) 296-6300.

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