Distributed Learning:
A flexible learning model for a global economy

Technical White Paper

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Abstract

This paper presents Obsidian's Distributed Learning model. Grounded in social constructivist theories of learning, the model emphasizes the use of blended learning solutions (instructor-led, online, mobile, ongoing performance support) to foster collaborative learning. There are three primary components in the model: Technology, Experience, and People. Obsidian's distributed learning solutions draw from each of these components depending on organizational constraints, instructional requirements, and learner needs. This paper discusses a variety of learning solutions that can be used in distributed learning environments, and it presents two case studies of distributed learning environments developed by Obsidian Learning.

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CONTENTS

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Overview

This paper discusses the use of "distributed learning" as a method of engaging learners in a blended environment. In this paper we will:

- Define *distributed learning* as a general term;
- Review the literature on learning theories, in particular social theories of learning;
- Describe the Obsidian Learning model of distributed learning; and
- Present case studies of Obsidian's Distributed Learning model in practice.

What is Distributed Learning?

The term *distributed learning* is used in many industries with a variety of meanings. While it is generally understood to represent an instructional model that includes blended, multimedia components, there is not a universally accepted definition.

In the terminology of cognitive psychology, "distributed learning" specifically refers to periods of study following instruction. Research has shown that distributing (or *spacing*) study periods increasingly further apart improves test performance (Son & Simon, 2012).

The use of "distributed learning" in the educational arena is not as precise. In most cases, the term is used to refer to learners who are "distributed," that is, separated by geography. Typically, such "distributed" learners work collaboratively to learn and to solve problems (see, for example, Koszalka & Wu, 2010; Lee & Cho, 2011; Terry & Doolittle, 2006).

While we will define the term more precisely in *Obsidian's Distributed Learning Model*, it is sufficient for now to note that the expression is generally used as an umbrella term including one or more of the following:

- **Blended learning**: Learning that combines instructor-led training (ILT) with Web-based training (WBT) and other learning activities outside the classroom, with such learning activities as pre-work, independent projects, mentorships, and internships. Includes both synchronous and asynchronous learning.
- **Mobile learning**: Learning that occurs on a portable device, such as a tablet or smartphone.
- **Informal learning**: Learning that occurs outside a formal learning environment (classroom, online class, etc.). This type of learning is facilitated by social interaction.

Theoretical Underpinnings of Distributed Learning

Distributed learning is best understood within the context of sociocultural theories of learning.

In this section we will briefly review the development of learning theory from behaviorism to social constructivism. We will also examine some of the social and emotional issues related to learning in an online environment.

The Social Construction of Knowledge

Over the last three decades, learning has been moving from teacher-centered (instruction as dissemination of information) to learner-centered (learning as construction of knowledge by the learner). This shift encourages students to experiment and explore, learn from experts and other students, find information online, and take responsibility for the learning of the group (Boekaerts, de Koning, & Vedde, 2006).

This change is a result of greater attention to *constructivist* models of learning (Boyle, Duffy, & Dunleavy, 2003; Driscoll, 2005). In these models learners do not passively receive knowledge but rather construct it themselves.

Behaviorist and cognitivist learning models

From the early years of the 20th century until the 1960s and 1970s, psychological and learning theories were dominated by behaviorism.

Behaviorist theories of learning are characterized by the notions of stimulus and response to modify behavior (see, for example, Skinner, 1984). In this model, learning is considered to be a change in observable behavior (Driscoll, 2005; Woo & Reeves, 2007). Through application of rewards and punishments, a behavior can be "unlearned" and a new behavior learned.

Behaviorist models are also “instructor-centered” in that instructors are *active providers* of knowledge (external to the learner) while learners are *passive recipients* of knowledge.

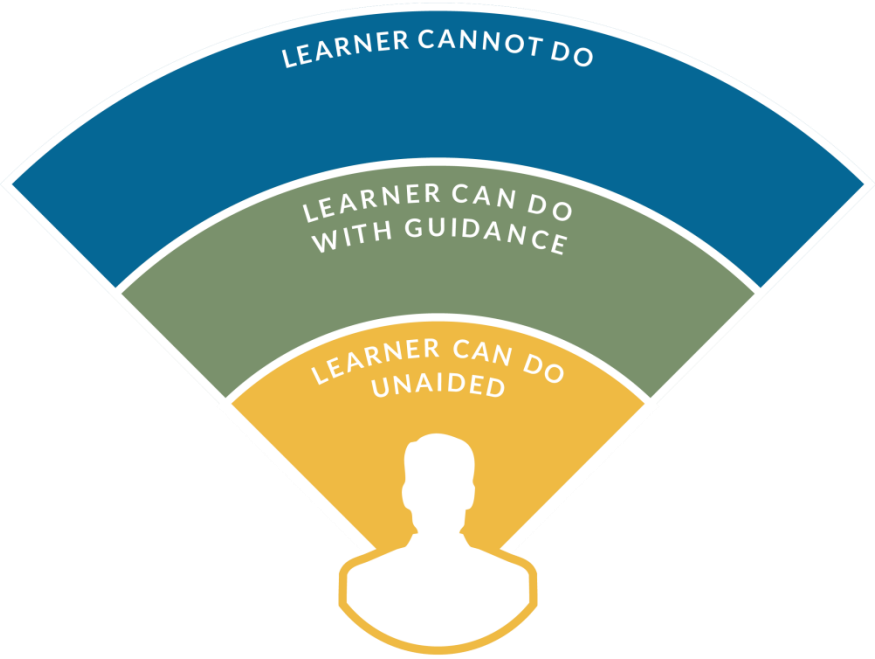
Instructor-centered learning

As research into cognitive psychology advanced, theories of learning became more nuanced than simple stimulus/response. One such theory is *cognitive information processing* (Driscoll, 2005), in which information from our senses is received by a sensory register, where some initial processing occurs. In this early stage of processing, we select from a bewildering array of sensory data and focus our attention only on relevant stimuli, discard the rest, and incorporate new knowledge into our existing knowledge.

In both behaviorist and cognitive theories of learning, knowledge is viewed as something external to the learner. Training is instructor-centered: The instructor imparts knowledge, while the learner passively absorbs it.

Social constructivist learning models

The move from the notion that knowledge is external to the learner to the notion that knowledge is internally constructed began with the work of Vygotsky (1978), who suggested that learning occurs through social interaction with others. Learning takes place as learners are moved, through social interaction with more advanced peers and adults, to higher levels of development.



Zone of Proximal Development (Vygotsky, 1978)

Proponents of a constructivist theory of knowledge suggest that learners do not absorb a body of knowledge external to themselves; rather, they construct their own knowledge from a variety of stimuli and experiences in ways that are personally meaningful. Instruction in this model of learning, then, is learner-centered.

Learner-centered instruction

Creating learner-centered experiences requires the instructional designer to create opportunities for social discourse that support personal learning and collective knowledge building; students must be encouraged to be active participants in identifying knowledge problems and collectively refining ideas (Hmelo-Silver & Barrows, 2008).

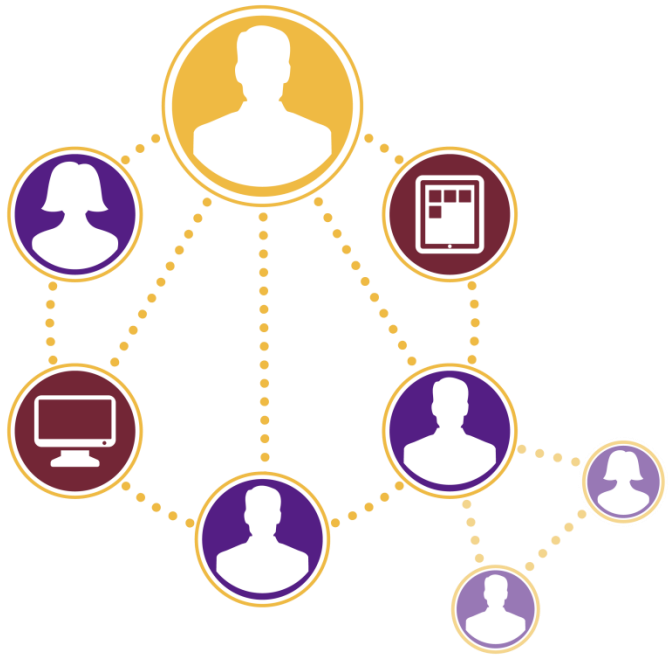
Social learning models

The concept of *social learning* is not new. Bandura's (1977) *social learning theory*, while thoroughly grounded in behaviorism, suggested that learning occurs by means of the interaction of personal and environmental factors. Reinforcement of learned behavior occurs through observation of others and through the learner's direct experience.

However, with the rise of sociocultural theories of learning, coupled with increasing use of the Internet and mobile technologies, concepts of social learning have broadened to include technological terms and concepts. For example, Wenger (2009) has also proposed a *social theory of learning*. The focus of this theory is "learning as social participation" (p. 210), in which learners actively participate in the practices of social communities and construct personal identities in relation to these communities.

Another social learning theory (and one that directly includes technology in its model) is *connectivism* (Bell, 2011; Downes, 2008; Siemens, 2005). This theory extends learning to

include knowledge gained by means of informal networks among people and from digital information available online. Learning is a process of connecting nodes or information sources and may reside in machines as well as human beings. The knowledge we gain from this kind of learning can be described as *connected* or *distributed* (Downes, 2008), and learning is greater when instructional activities promote connecting nodes instead of simply learning facts and procedures (Mundie & Hooper, 2014).



Social learning

For example, in an ethnographic study of a Danish social networking site used by young people between 13 and 17 years of age, Ryberg and Larsen (2008) noted the emergence of a concept of "networked identity," which is multidimensional and relational. Among the possible implications of this concept, the authors suggested learning environments could be based on the metaphor of *networks* and be built on students' and instructors' interests rather than solely on subject matter and courses.

Social Learning in a Global Context

In today's global economy, with learners often separated by space and time, social learning presents new challenges. By its nature, online learning can be socially isolating. A single learner completing an online learning module might have little or no contact with other learners. In virtual ILT, remote learners might not be able to collaborate with learners in the classroom.

We will consider two factors in the social implications of interaction among learners who might be geographically separate: *distance* and *social presence*.

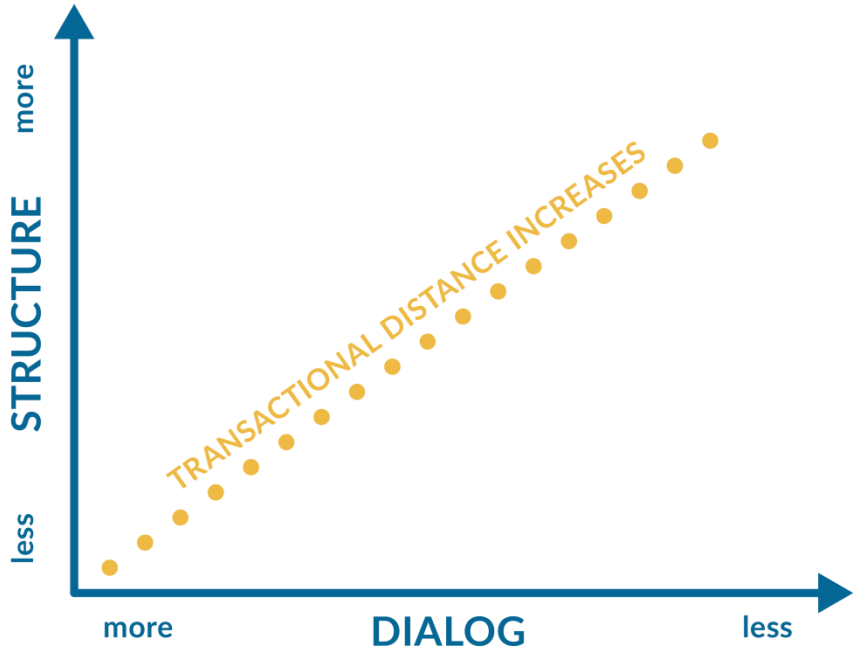
Distance

The term "distance" in online learning can be viewed in more than one sense. The first, and most obvious, sense is *geographical distance*: learners who are not co-located but rather dispersed throughout the world. The second sense of distance is *psychological distance*: the separation of objects and events from an individual's direct experience (Kalkstein, Kleiman, Wakslak, Liverman, & Trope, 2016).

A third sense of distance in online learning is *transactional distance*. As articulated in Moore's (1972, 1973) *transactional distance theory*, transactional distance refers to the pedagogical relationship between instructor (or course) and the learner.

Transactional distance is determined not by geography but by the relationship between *dialogue* and *structure* (Moore & Kearsley, 2012). "Dialogue" here means not just communication but also positive qualities of meaningful interaction (between instructor and learner and between learner and learner) that foster learning. "Structure" refers to the elements of course design, such as objectives, activities, assessments, etc.

All formal learning falls along a continuum of transactions from less distant (greater interaction and less structure) to more distant (less interaction and more structure).



Transactional distance (adapted from Moore, 1973)

The goal in online learning design is to minimize transactional distance. For example, just watching an instructional video is a highly structured activity with perhaps no dialogue among learners, so this activity has high transactional distance. To lower the transactional distance, the instructional designer might include group discussion of the video in the course design.

Social presence

Social presence refers to the degree to which learners feel "present" in a learning environment. In face-to-face interactions, social presence is high because learners are able to see, hear, and communicate (verbally and using non-verbal cues) with other learners. In an online environment, social presence can be lower because direct communication factors are absent or diminished. Social presence may be a critical factor in online learning and can improve learner performance (Hostetter, 2013).

Reporting the results of a study on collaboration in an online peer review group, Zhao, Sullivan, and Mellenius (2014) identified three dimensions that contribute to collaboration: participation, interaction, and social presence. They found that **participation** is required for interaction and collaboration to occur, but it does not automatically ensure they will occur. Next, **interaction** is a prerequisite for collaboration to occur, but again it does not ensure it will occur. Finally, they found that **social presence** emerges from interaction, and an optimal level of social presence improves the quality of participation and interaction and thus promotes collaboration.

Optimal social presence promotes a "warm and supportive learning community" (Zhao, Sullivan, & Mellenius, 2014, p. 817), and the authors describe the actions of the group of participants with the highest level of social presence:

- They created a discussion space for open interaction, fostering group cohesion and encouraging interaction.
- They gave feedback that contained compliments of peers' work, and those who received feedback expressed thanks to their peers.
- The compliments and thanks created a warm and supportive community, leading learners to a sense of *camaraderie* in which they felt free to express difficulties.

Whiteside (2015) has proposed a Social Presence Model. As shown in the following table, the model contains five elements that work together to affect learners' motivation to take an active role in their own and their peers' learning. These elements can be used as a model for designing learning experiences that maximize social presence.

Affective Association	The emotional connections among participants. These connections include personal emotion, humor, and self-disclosure.
Community Cohesion	Individual sharing of resources and information with the group. Viewing the group as a cohesive whole. At the interpersonal level, this element also includes being an approachable group member (using greetings and sharing with other members).
Instructor Involvement	Instructors provide community-building activities and encourage learners to engage constructively with other learners.
Interaction Density	This element describes the level of interaction among participants. Interaction density includes acknowledgement of others' input, agreement, disagreement, compliments, and questions.
Knowledge and Experience	The group's collective knowledge and experience are important for building social presence and can enhance discussion and collaboration.

Social Presence Model (adapted from Whiteside, 2015)

Obsidian's Distributed Learning Model

Theory into Practice

Given the social constructivist theories of learning described in the previous section, what are the characteristics of distributed learning?

First and foremost, learning must be fully **learner-centered**, supporting the learner not only in periods of formal training but also in times of need in the workplace. Learners do not passively absorb information from the "sage on the stage." Instead, social, collaborative experiences enable both personal and group construction of knowledge. Access to online tools promotes integration of personal experience with networked knowledge.

Second, learning should be **blended**. Particularly in times of economic downturn, learning experiences must be focused, easily manageable, and targeted to the unique needs of the adult learner. It is expensive, time-consuming, and ineffective to keep learners in a classroom for days. Instead, learning should be ongoing, occur when needed, and make use of inexpensive (if not free) technologies.

Third, learning should be a **social experience**. It should provide opportunities for collaboration and interaction – both within formal learning experiences and continuing in the workplace, in the form of collaborative problem-solving, ongoing performance support, and communities of practice. Instructional design for distributed learning must take into account social presence, using learning strategies that encourage and build camaraderie and engagement. Just as connectivism suggests that learning also includes knowledge gained from online sources, Ohler (2008) states that we each have our own "personal learning network (PLN)" (Ohler, 2008, p. 8) in which we find information to meet our own learning goals.

Distributed Learning: The Obsidian Model

To bring these three factors together in a comprehensive solution, Obsidian Learning uses the term "distributed learning" to describe learning that is:

- blended, using various combinations of ILT, WBT, and mobile learning;
- spread out over time, including formal training, informal learning, refresher;
- just-in-time (JIT) learning that occurs at the point of need, along with performance support; and
- focused on competency development rather than on general knowledge growth.

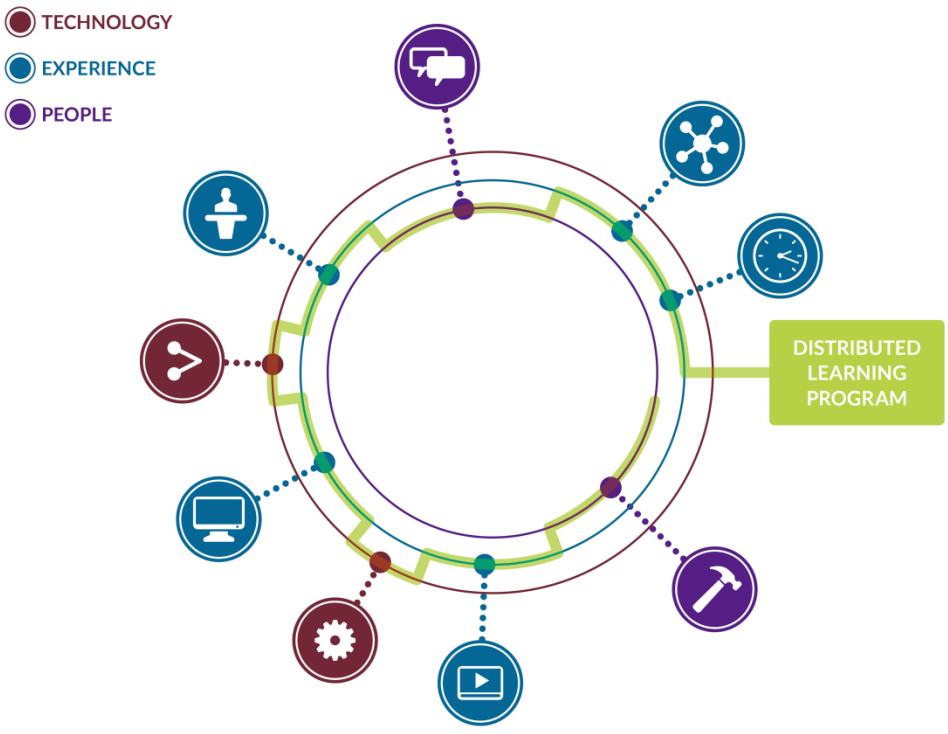
Components of the model

There are three major components of Obsidian's Distributed Learning model:

1. **Technology**: Through technology – in the classroom, on the LMS/LRS, on social media platforms like Twitter or Facebook – learners are empowered to collaborate with each other and to seek resources for their own personal learning networks (PLNs).

2. **Experience**: A variety of learning experiences using a variety of media – instructor-led training (both classroom and virtual), Web-based training, performance support (for just-in-time learning), communities of practice – leads to increased learner engagement and builds the technology-mediated collaboration skills that are so vital in our global economy.

3. **People**: Collaborative learning is a key component of Obsidian's Distributed Learning model. Learning experiences should encourage collaborative problem-solving, learning through interaction with others, the development of ongoing communities of practice, and forming connections, e.g., PLNs connecting with other PLNs.



Obsidian Distributed Learning Model

Designing a Distributed Learning Environment

For successful implementation of distributed learning, the designer should augment the traditional elements of instructional design to include the three components of our model:

- Technology
- Experience
- People

Technology

What tools can be used to enhance social learning in Obsidian's Distributed Learning model?

Learning Portal: A designed page (or set of pages) – housed on a Learning Management System (LMS), SharePoint, or some other Web site – that serves as the hub of the program. The portal can include learning maps, reference materials, online discussion forums, etc. Enabling technologies can include chat tools like Skype or Google Hangouts and webinar/forum tools like WebEx and Adobe Connect.

Social Networking Technologies: Social networking tools – such as blogs, wikis, and online networks of friends and professional colleagues – can be powerful enablers of social, collaborative learning. The user-centered and interactive nature of social networking technologies enables collaboration and sharing of information (Chen, Wu, & Yang, 2008), and can thus be used to support the development of online learning communities (Yan, 2008). Technologies like wikis and blogs can capture the co-creation of knowledge by a group of learners (Mondahl & Razmerita, 2014), while Facebook's closed group feature can be used as a platform for online discussion and collaboration (Norman, Nordin, Din, Ally, & Dogan, 2015).

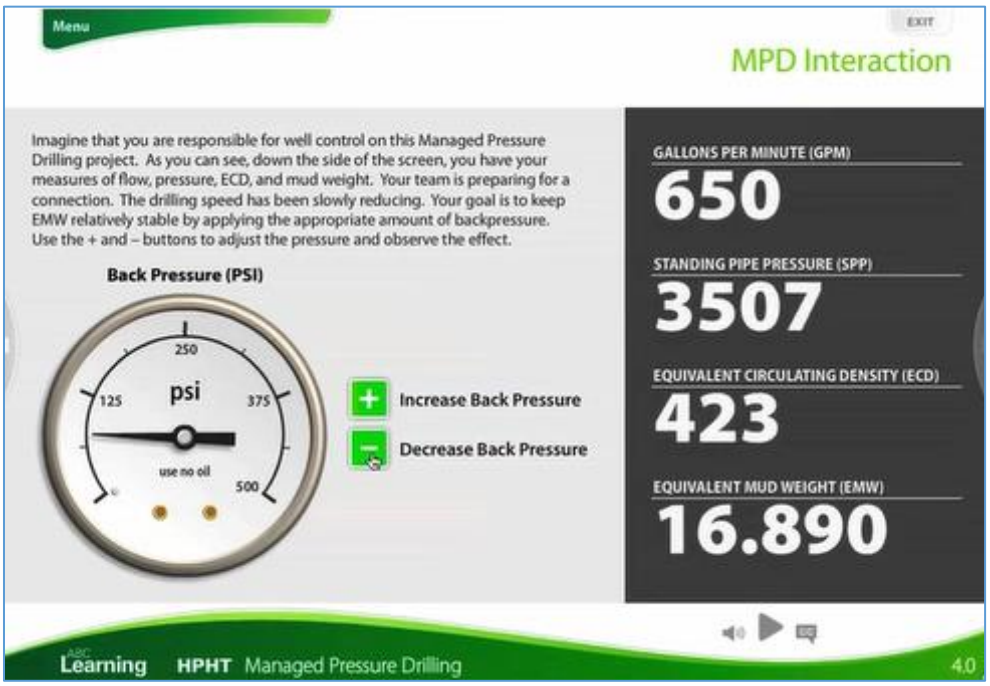
Mobile Learning: Learning that is delivered using mobile communication technologies, such as tablets, smartphones, and similar devices (Cochrane & Bateman, 2010; Goh & Kinshuk, 2006; Motiwalla, 2007). Mobile learning can include performance support systems, brief tutorials, checklists, videos, teleconferencing (chat), and microlearning.

Experience

What learning experiences will best meet the needs of the learner – and when should they occur? In some instances, a short classroom ILT might be all that is needed. Alternatively, virtual ILT with technology-driven collaboration might better meet the needs of dispersed learners.

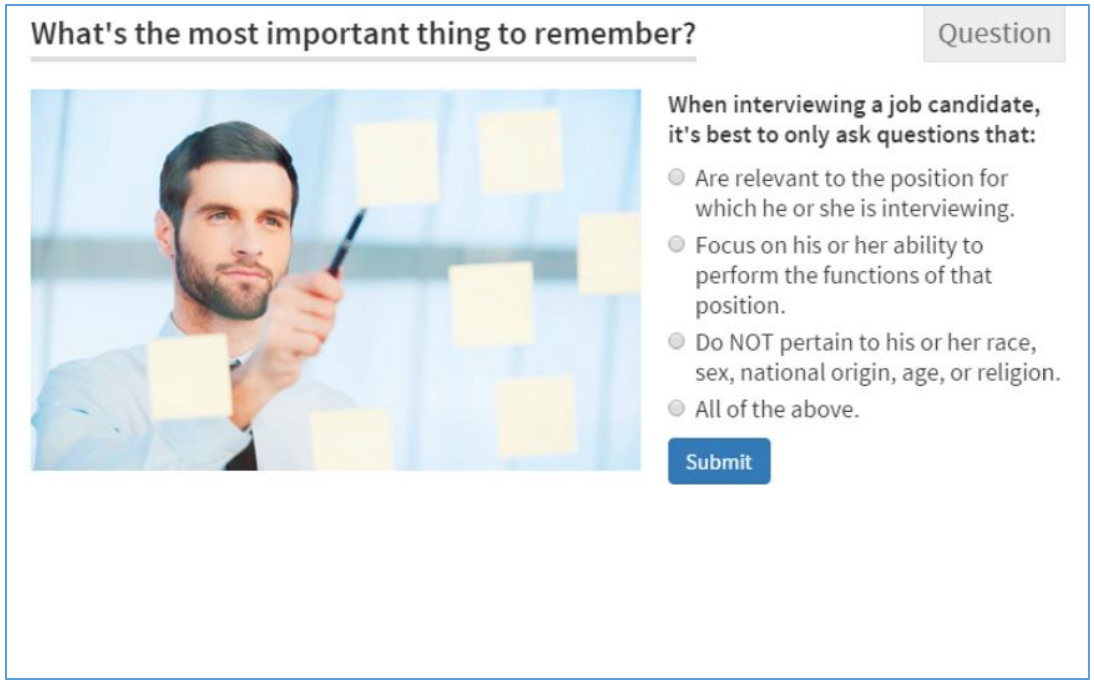
In this section, we will examine the learning experiences available in the distributed learning environment.

Web-Based Training (WBT): Sometimes called eLearning (electronic learning), WBT is facilitated and supported through the use of information and communications technology. Typical delivery of eLearning is via the Internet using such technologies as self-paced courses, teleconferencing, and video conferencing. Here is an example of WBT developed by Obsidian Learning: Managed Pressure Drilling.



Instructor-Led Training (ILT): Training that is facilitated synchronously by an instructor, in either a classroom or virtual setting. ILT can contain such learning strategies as lectures, discussion, group activities or projects, and work completed outside the classroom. In Obsidian's Distributed Learning model, ILT is usually brief and very focused on problem-solving and application. Here is an example of ILT developed by Obsidian Learning: Interactive Multi-Day Technical Workshop.

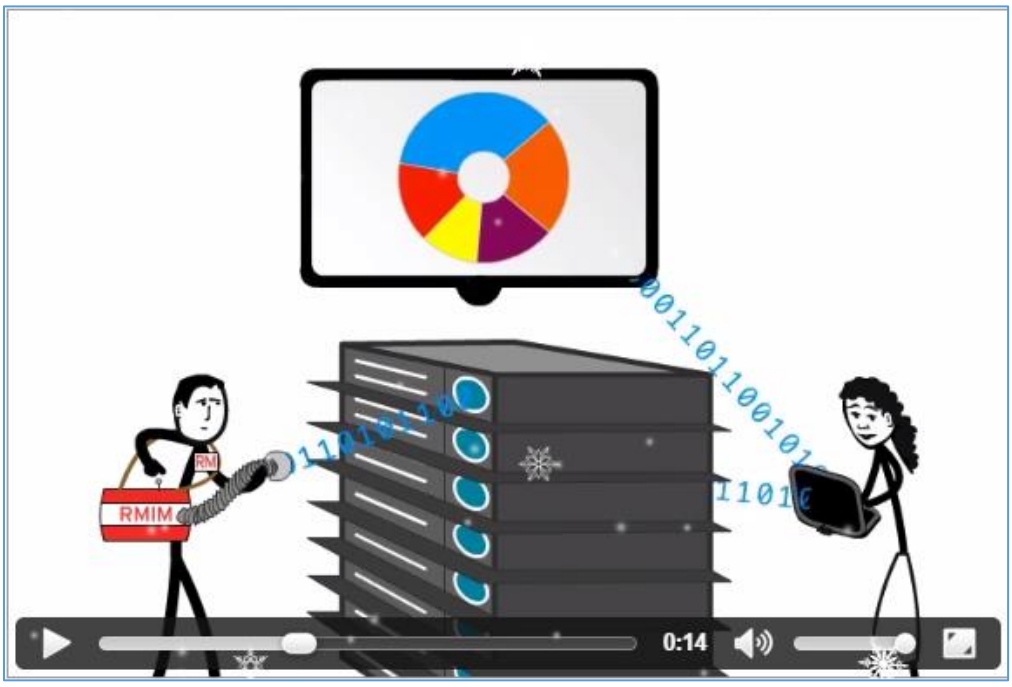
Microlearning (learning nuggets): Brief learning activities (lasting a few seconds up to several minutes) that can be used to enhance (or even replace) larger course modules; examples include brief videos followed by quizzes, and micropodcasts delivered on platforms like YouTube, Twitter, and SoundCloud (Semingson, Crosslin, & Dellinge, 2015). At Obsidian, we often use the term "learning nuggets" to describe microlearning. As described by Bailey, Zalfan, Davis, Fill, and Conole (2006), learning nuggets are tasks that learners perform in a *particular* context in order to attain *specific* outcomes. Thus, as targeted and contextualized pieces, microlearning (or learning nuggets) can be used with mobile technologies to provide just-in-time performance support. Here is an example of microlearning developed by Obsidian Learning: Quick Guide to Employee Discrimination.



Learning Video (eClip): With the rise in popularity of free video sharing sites such as YouTube and Vimeo and the availability of quality video capturing technology on smartphones, videos as a learning format are becoming increasingly popular.

Videos are not only used to capture the intricate details of many subjects (as on www.khanacademy.com, for example) but are often used to explain and simplify complex concepts, systems, or processes. Because ideal learning videos are typically brief (from three to five minutes long), they are well-suited for mobile learning.

Here is an example developed by Obsidian Learning: Information Management Video.



Guided Project Work: In a guided project, the course facilitator or another expert provides input and advice while learners work collaboratively to solve a problem or complete a project. Because workplaces frequently have project teams with members from different disciplines or areas of expertise, a guided project team ideally is composed of learners from several disciplines. With input from peers, direction from an expert, and collaborative work, learners gain a greater understanding of course concepts and how to apply them in the workplace.

Simulations: A simulation is an instructional strategy that replicates as much as possible an actual situation, process, or procedure. Simulations can be done in person (in the form of role playing) or using technology (both in-person and online). Simulations should be learner-centered, meaningful, and transferable to the workplace (Beckem & Watkins, 2012). Indeed, research has suggested that simulations promote self-efficacy (the learner's sense of ability) and transfer of learning to the workplace (Gegenfurtner, Quesada Pallarès, & Knogler, 2014). With the addition of gaming elements, *game-like simulations* can add learner "competition," increasing engagement (Borro-Escribano, Del Blanco, Torrente, Alpuente, & Fernández-Manjón, 2014).

Coaching and Mentoring: Observation of problem-solving strategies used by experts (referred to as cognitive apprenticeship) is helpful as novices learn new skills, and this method can be an important tool for Web-based collaboration (Kuo, Hwang, Chen, & Chen, 2012). In Obsidian's Distributed Learning model, learners engage in real-world practice and skill-building by working with coaches or mentors in the workplace.

People

How can learning bridge social and geographical gaps, enabling collaborative learning? How can we give all learners, no matter where they are located, a sense of social presence in the learning community?

To maximize opportunities for collaborative learning, distributed learning experiences should include activities to enhance social presence in all types of learning interactions: student-to-student, student-to-teacher, teacher-to-student, student-to-content, student-to-world. As suggested in the earlier discussion of *Social presence*, select from the following strategies:

- Create a discussion space for open interaction to foster group cohesion and interaction.
- Encourage both facilitators and learners to give feedback that contains compliments and express gratitude in order to create a supportive learning community. Support open expression of acknowledgement of others' input, agreement, disagreement, compliments, and questions.
- Use personal emotion, humor, and self-disclosure to strengthen emotional connections in the group.
- Provide tools for individual sharing of resources and information with the group. Remember that the group's collective knowledge and experience are important for building social presence and can enhance discussion and collaboration.

Consider also ways to assess mastery not only of content but also of the social, collaborative elements of learning in the 21st century. For example, Starkey (2011) has proposed a "digital learning matrix" that captures the activities required for learning with digital technologies. In this model, learning is measured not just in terms of individual achievement but also by examining the ways in which learners connect with others to collaborate and share the creation of knowledge. Examples of such collaborative learning include communities of practice and personal learning networks:

Community of Practice (CoP): A type of collaborative learning community wherein an informal grouping of people share expertise and interest in a common activity (Wenger & Snyder, 2000). Online tools like wikis can be used for collaborative knowledge collection in a CoP (Gunawardena, Hermans, Sanchez, Richmond, Bohley, & Tuttle, 2009).

Personal Learning Networks: Just as connectivism suggests that learning also includes knowledge gained from online sources, Ohler (2008) states that we each have our own "personal learning network (PLN)" in which we find information to meet our own learning goals. Again, social networking tools can support *self-directed learning* (Van Harmelen, 2008) – an important activity in the development of PLNs.

Obsidian Distributed Learning Case Studies

How can you use Obsidian's Distributed Learning model to enhance learning in your organization? What is the cost of distributed learning solutions, and are they worth the investment? In this section, we present two case studies of distributed learning solutions demonstrating that Obsidian's approach is cost-effective, enhances learning, and provides solid value.

Case Study One

Our client was the sales division of a global technical services company that provides hardware, software, and consulting solutions to the financial industry. They needed more efficient, less costly solutions for training new sales representatives and for providing ongoing training and support to the entire organization.

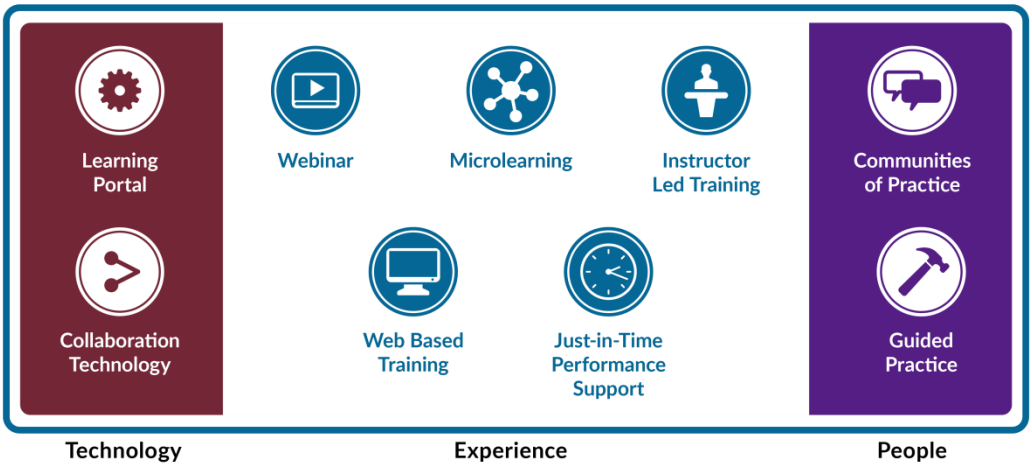
Most of the sales training was ILT, provided in three regional training centers: one in the US, another in Europe, and another in Asia. However, even with regional centers, training was costly and required employees to travel to their regional center. In addition, the company had an LMS housing primarily Flash-based courses. It had nothing in place for ongoing support in the field, other than informal learning and WBT refresher courses.

The company provided training twice per year, for three days in three locations. In each location, there were 25 attendees and one instructor. The total cost per year was $970,000.00, as broken down below:

Costs	
Time spent in classroom	$720,000.00
Travel/accommodation	$225,000.00
Instructor and materials	$25,000.00
Total Costs per Year:	**$970,000.00**

Obsidian's Solution

Using our Distributed Learning model, we implemented a blended solution designed according to the **Technology**, **Experience**, and **People** framework.



Obsidian Learning's solution for global technical services company

Technology

We developed a robust learning portal to support mobile applications and virtual collaboration, which included the following features:

- **Teleconferencing** for virtual ILT to lower costs for travel, accommodation, and printed materials.
- **Mobile performance tools** to reinforce training and provide ongoing support and social interaction.
- **Online discussion groups and wikis** to enable communities of practice for collaboration, knowledge base, etc.

Costs	
One-time development	$45,000.00
Yearly maintenance	$10,000.00

Experience

Overview of Company WBT: Before taking the instructor-led portion of the curriculum, learners complete a **WBT** course that provides an overview of the company and the sales process. The intent of this course is not only to teach new employees the value of the company's products and services, but also to create a positive attitude toward the company, and make them eager to sell products and services to new clients. Learners would take a final assessment to demonstrate mastery of course objectives. The length of this course is **30 minutes**, broken into small chunks to accommodate the schedules of mobile learners, and it was developed in HTML5 for compatibility with mobile devices.

Costs	
One-time development	$30,000.00
Cost for time spent taking WBT	$30,000.00

Making the Sale ILT: Learners meet for a one-day instructor-led course. Regional training centers use **virtual tools** to include both co-located and remote learners. Employees based near the training centers meet in the classroom, while more remote employees participate online.

Costs	
One-time development	$45,000.00
Time spent in classroom	$240,000.00
Travel/accommodation	$0.00
Instructor and materials	$5,000.00
Total Costs per Year:	**$290,000.00**

Obsidian developed train-the-trainer materials to teach facilitators techniques for maximizing **social presence**, collaboration, and group cohesion.

Course participants briefly review the WBT topics and then engage in the following activities:

- Participate in facilitated discussions of the company's value proposition and competitors' products and services.
- As a motivational exercise, the course includes a 5-10 minute learning video on the company. This learning video is also made available to reps for sharing with clients.
- Enact role-playing scenarios to learn how to conduct calls and meetings with prospects. It is important that co-located and remote employees do these scenarios together, since they frequently need to conduct client meetings virtually.
- Participate in facilitated discussions and practice addressing prospect questions and objections.

People

Guided Practice: At the conclusion of the Making the Sale class, learners develop Action Plans for the field activities they will perform 30, 60, and 90 days after the class. The plans include **coaching/mentoring** with senior leadership and **guided project work** with more experienced sales representatives.

Costs	
One-time development	$20,000.00
Yearly maintenance	$5,000.00

Mobile Performance Support: To support learners after formal training, Obsidian developed mobile job performance support applications:

- **Interactive "Prospecting Guide"** summarizing the key points of training, **mobile apps** for giving quotes to customers, and **videos** and **podcasts** with tips for conducting client calls. For added engagement, the tool includes **social gaming**, in which learners "compete" for the highest number of cold calls made, open opportunities, closed-won opportunities, and closed-lost opportunities. High scoring learners are rewarded with badges.
- **Follow-up training** in the form of brief **microlearning (training nuggets)** using social media and other technology to give learners opportunities to practice key skills. For example, learners might receive a text or tweet saying, "Your customer has done *X*; what would you do?" or be prompted to watch a brief video on closing deals.

- **Quick reference checklists** showing key product features, value proposition, competitor information, etc.

Costs	
One-time development	$50,000.00
Yearly maintenance	$5,000.00

Periodic Webinars: Using teleconferencing tools, learners discuss new products/services, review selling strategies, and continue the development of individual personal learning networks (PLNs).

Community of Practice: Using online discussion groups, sales team members share war stories, ask for advice, and work collaboratively on proposals and presentations. Best practices are captured in a wiki to build a knowledge base.

Results

Implementation of our distributed learning solution incurred the following one-time development costs:

Element	Solution	Costs
Technology	Learning portal	$45,000.00
Experience	WBT	$30,000.00
	ILT	$45,000.00
People	Guided practice	$5,000.00
	Mobile performance support	$5,000.00
	Total One-Time Cost:	**$130,000.00**

After implementation of our solution, the following annual costs are incurred:

Element	Solution	Costs
Technology	Learning portal	$10,000.00
Experience	WBT	$30,000.00
	ILT	$45,000.00
People	Guided practice	$20,000.00
	Mobile performance support	$50,000.00
	Total Recurring Costs:	**$155,000.00**

The year-over-year return on investment (ROI) for our client has been tremendous. As noted above, when the client first engaged Obsidian Learning, their annual training cost was **$970,000.00**. The upfront development costs for our solution were **$130,000.00**, already significantly less than their annual cost for training.

We calculated ROI by identifying the total financial benefit the client gained from our solution, and then subtracting from that the total investment made to develop, produce, and deliver the training (Kirkpatrick & Kirkpatrick, 2006).

To determine the financial benefit of our solution, we identified hard data and soft data elements, as well as cost items (Phillips, 1996):

- **Hard data** elements are benefits to which monetary amounts may be assigned.
- **Soft data** elements are benefits to the organization to which it is difficult or impossible to assign monetary value.
- **Cost items** are investments made to develop, produce, and deliver a learning solution.

The following table illustrates the factors we used to calculate ROI for our solution.

Hard Data	Time in class	$720,000.00
	Travel/accommodation	$225,000.00
	Instructor and materials	$25,000.00
	Total Benefits:	**$970,000.00**
Cost Items	Learning portal	$45,000.00
	WBT	$30,000.00
	ILT	$45,000.00
	Guided practice	$5,000.00
	Mobile performance support	$5,000.00
	Total Costs:	**$130,000.00**

Total benefits were determined to be $970,000.00, and total costs were determined to be $285,000.00. Based on these values, we determined ROI to be **240.35%**.

To calculate the cost-benefit ratio, we divided total benefits by total costs, and we obtained a ratio of **3.40**. This ratio indicates that for every $1.00 spent in development, a benefit of $3.40 is received.

Case Study Two

Our client was a small/medium-sized service company that provides high pressure pumps and other equipment to the petrochemical industry. Though a relatively new company, it was growing fast (from 300 to 1,000 employees in the first year of operation). Since the pressure pump operators were all new employees, and they were handling expensive and dangerous equipment, they needed very targeted and efficient training. Onboarding the pump operators consisted of half a day spent with the Human Resources department completing paperwork, followed by on-the-job training with a more experienced operator.

The entire workforce was US-based, and most of the work was performed by operators in the field, so training had to be accessible, fast but comprehensive, and include ongoing support. The company did not have an LMS.

We decided to test the distributed learning concept with a particular competency need. Pump packing was one of the most expensive and intensive procedures the operators were required to perform. The pump seals and the entire procedure cost approximately $250,000.00 per occurrence. Pump repacking takes 8 to 10 hours of work, and it must be performed once a month. Any mistake in the packing process results in a complete re-do, and the costs add up quickly. Before implementing our solution, the client experienced about 12 failures each year, all due to mistakes in packing, at a loss of approximately $3 million.

Obsidian's Solution

Using our Distributed Learning model, we implemented a blended solution designed according to the **Technology**, **Experience**, and **People** framework.

Technology

We developed an Intranet portal on the client's existing SharePoint platform to deploy the training, support mobile applications and virtual collaboration, and track the training completion as well as the work performed:

- **Individual sign-in** for each operator to access training, reference materials, discussions, dashboards.
- **Performance tools** to reinforce training and provide ongoing support and social interaction.
- **Online troubleshooting groups and learning videos** to enable communities of practice for collaboration, knowledge base, etc.

Experience

Pump Packing WBT: Before taking the on-the-job application and assessment portion of the curriculum, learners complete a **WBT** course that provides a detailed, step-by-step process for pump packing. The WBT was broken down into separate modules, one for each step of the process. The course was designed as a series of drawings and schematics overlaying an actual video of the process. Learners would have the opportunity to virtually practice (at a diagram level while also observing the real life video) each step of the process. Each step is standalone, and the learners can also access the individual video of each step from any device, at any time.

Application and Assessment: Learners go through the pump packing process in teams, as part of their job, while supervised by an experienced operator. Learners also complete an online assessment and then perform a hands-on, in the field demonstration.

Over the course of six months, learners also engage in the following activities:

- Participate in discussions in the Troubleshooting Corner (a forum on the SharePoint portal) where they review and discuss different aspects of the pump packing process and other unusual problems that come up during their job.
- Post pictures and videos from their Application and Assessment activities, as well as their first pump packing after the training is complete.

People

Mobile Performance Support: To support learners after formal training, Obsidian developed mobile job performance support applications:

- **Interactive "Quick Reference Guide"** summarizing the main steps of the process, describing possible error traps, and providing links to the Troubleshooting Corner.
- **Packing Dashboard** deployed as a means of increasing learner engagement. This tool includes social gaming, in which learners "compete" for the highest number of "perfect packings" made, problems solved, and answers to other problems posed by various operators. High scoring learners are rewarded with badges.
- **Community of Practice** that provides a forum for discussing issues and offering solutions in online discussion groups. Pump packing best practices are captured in a wiki to build a knowledge base.

Results

Implementation of our distributed learning solution incurred the following one-time development costs:

Element	Solution	Costs
Technology	Learning portal	$75,000.00
Experience	WBT	$45,000.00
	Application and assessment	$20,000.00
People	Guided practice	$5,000.00
	Mobile performance support	$5,000.00
	Total One-Time Cost:	**$150,000.00**

After implementation of our solution, the following annual costs are incurred:

Element	Solution	Costs
Technology	Learning portal	$10,000.00
Experience	WBT	$0
	Application and assessment	$0
People	Guided practice	$10,000.00
	Mobile performance support	$20,000.00
	Total Recurring Costs:	**$155,000.00**

The solution has been highly successful for our client. As noted above, when the client first engaged Obsidian Learning, their yearly cost of losses due to mistakes was approximately **$3 million**. The upfront development costs for our solution were **$150,000.00**. In the first year after the training program was implemented, the company experienced only three failures due to packing mistakes. This alone represents a savings of **$2.25 million**.

Conclusion

In this paper, we have presented Obsidian's Distributed Learning model. The model is grounded in social constructivist learning theory and makes use of technology for learning, performance support, and social connection.

Obsidian Learning's approach is well-suited for adult learners, particularly in corporate or institutional environments. And as the results of our case studies indicate, our approach to distributed learning provides tangible value to our clients, making it a cost-effective solution even in periods of economic downturn.

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About Obsidian Learning

Simply Effective: two words that capture our approach to developing custom tools and products for learning. Since 1998, Obsidian Learning has been providing medium and Fortune 500 firms with interactive learning programs grounded in cognitive research, adult learning theory, and universal design principles.

In 2015, Obsidian applied these practices to the design and development of Obsidian Black, an HTML5 authoring tool for today's mobile learner. Our team of programmers and instructional designers collaborated to create a tool for rapid authoring of interactive content in native HTML5 for responsive output on all devices. Using Obsidian Black, standards-conformant (SCORM/xAPI) content can be quickly exported for LMS/LRS integration and deployment.

Stephen Victor, Ph.D.

Steve is a Strategy and Design Lead at Obsidian Learning in Houston, TX. In this role, he develops and implements best practices for instructional design and eLearning, including ID competencies, mobile delivery strategies, and quality assurance processes. He also develops and supports training strategy and learning deliverables, including technology recommendations, creative learning interventions, and solution design documents.

With over 20 years in the learning industry, he has completed major initiatives for oil and gas, healthcare, insurance/financial, telecommunications, airline, retail, and government agencies. He holds a Ph.D. in Education (Instructional Design for Online Learning emphasis) from Capella University.