CHAPTER

12

Team Training in Organizations

It Works—When Done Right

Eduardo Salas, Denise L. Reyes, *and* Amanda L. Woods

Abstract

Taking into account the increasing level of importance that organizations place on teamwork, understanding the core components of team training programs is more critical than ever. The present chapter begins by introducing the key concepts and operational definitions surrounding team training. Next, team training elements are organized in terms of where they occur over the course of training, beginning with what matters *before* (e.g., training needs analysis), then *during* (e.g., design and delivery elements), and finally *after* (e.g., sustainment) training takes place. This organizational structure is referred to as the lifespan of team training. Examples of preexisting science-based team training programs that have been regarded as highly effective are provided to paint a clearer picture of what these programs look like in terms of design and delivery. Lessons learned from previous training efforts and future directions are also discussed.

Keywords: teams, training, teamwork, team development, team learning, team intervention

Today, more than ever, teamwork is essential for the success of organizations across all domains. Complex and difficult tasks require the effort of many individuals. As such, organizations depend on the use of teams to accomplish these tasks. Teamwork is needed across multiple fields, such as the military, the aviation and space industry, health care, corporations, and educational institutions. Teams not only accomplish complicated tasks that would otherwise be impossible for a single individual to achieve, but their outcomes can have extremely important consequences. For example, effective teams can generate knowledge, minimize errors, cultivate new ideas, increase productivity, improve job satisfaction, ensure success, and even save lives (Hughes et al., 2016; LePine, Piccolo, Jackson, Mathieu, & Saul, 2008; Salas et al., 2008)! Teamwork failures (e.g., miscommunication) significantly contribute to detrimental errors; however, teams can learn how to be more effective through team training. A study on the effectiveness of medical team training in reducing surgical mortality used a propensity matched mortality assessment that "showed an almost 50% greater decrease in annual mortality in the trained group (RR, 1.49; 95% CI, 1.10–2.07; P=.01) than in the nontrained group" (Neily et al., 2010, p. 1698).

To implement team training effectively, we must look to the science of team training and performance. Organizations need to comprehend the dynamics of teams and how they learn, develop, and perform. In the past decade, strides have been made in assessing what works in team training and how to apply it to organizations (e.g., Dunn et al., 2007; Merién, Van de Ven, Mol, Houterman, & Oei, 2010; Salas et al., 2008; Siassakos et al., 2013; Weaver, Dy, & Rosen, 2014). There is a plethora of theoretically driven empirical research to guide the understanding of teams and how to go about training them (Bell, Tannenbaum, Ford, Noe, & Kraiger, 2017).

What's the Cure to Teamwork Failures? Team Training

Scientific-based approaches for team training have been created and successfully implemented to cure

teamwork failures. This is evident in multiple meta-analyses (Delise, Allen Gorman, Brooks, Rentsch, & Steel-Johnson, 2010; Hughes et al., 2016; Salas et al., 2008; Salas, Nichols, & Driskell, 2007). For example, Delise and colleagues' (2010) meta-analysis found a direct, positive effect of team training on affective, cognitive, task-based skill, and teamwork skill outcomes. Specifically analyzing cross-training, team coordination and adaptation training, and guided team self-correction training, Salas, Nichols, and Driskell (2007) found that all three strategies improved performance. Their results suggest that focusing on improving coordination strategies and reducing overt communication errors makes the largest contribution to effective team training. Salas and colleagues (2008) also concluded that team training interventions produced positive affective, cognitive, teamwork processes, and performance outcomes. A post hoc analysis revealed a moderate positive effect on these outcomes for coordination training and cross-training, suggesting more research is needed on effects of team training based on these strategies (Salas et al., 2008).

The most recent meta-analysis on team training in health care found that trainees had positive reactions to it, and it made improvements on learning, transfer, and results (d = .37 to .89) (Hughes et al., 2016). Specifically, Hughes and colleagues found that affective-based learning, cognitive-based learning, skill-based learning, affective-based transfer, and skill-based transfer took place. In addition, organizational outcomes such as safety climate and patient outcomes improved as a result of health care team training. Hughes and colleagues also noted a sequential effect of health care team training where learning outcomes lead to transfer outcomes, which improve results. Unfortunately, organizations continue to disregard these evidence-based strategies and still practice ineffective exercises (e.g., trust falls, rope courses). Scientific-based team training must be implemented because it can increase learning, improve performance on the job, and even save lives (Driskell, Lazzara, Salas, King, & Battles, 2012).

Team training works—if done right. The purpose of this chapter is to review the literature on team training in an effort to outline its lifespan so that training options can be further developed and properly implemented. The majority of the chapter will focus on the lifespan of team training (i.e., before, during, and after developing a team training program). We will cover the importance of creating a positive organizational climate and conducting a needs analysis prior to training. Then, we will touch on the design and delivery methods that are increasingly used in team training along with examples of existing training programs. Next, we will address team training evaluation and sustainment of training outcomes, because this is necessary to ensure the effectiveness of a team training program. Finally, we will conclude with lessons learned and concerns for the future of team training.

Definitions

First, let us cover a few definitions related to team-oriented research.

Teams

We define a team as a type of group that is made up of "a distinguishable set of two or more people who interact, dynamically, interdependently, and adaptively toward a common and valued goal/objective/mission, who have been assigned specific roles or functions to perform, and who have a limited life-span of membership" (Salas, Dickinson, Converse, & Tannenbaum, 1992, p. 4). Not all teams are identical, of course. There are different types of teams that require specific skill sets (e.g., action teams, service and production teams, research and development teams). Moreover, teams can contain members with different backgrounds, experiences, and ideas. Finally, teams work within organizations with different norms, policies, and cultures.

Teamwork and Taskwork

Teams must execute both taskwork and teamwork to accomplish shared goals. Taskwork refers to the actions needed to carry out a specific duty that contributes to the overall goal. Teamwork, on the other hand, deals with the interdependent interactions between members of a team while they work toward a specific goal (Salas et al., 2015). One without the other can have tremendous negative consequences in regard to team performance. For example, a physician can be highly skilled in conducting a surgical procedure, but if he or she lacks the communication skills necessary in the surgical team (e.g., identifying the patient and procedure to others, establishing roles, and making sure the correct equipment is gathered), human error can take place, and, in the most extreme cases, wrongful death of a patient can occur. Taskwork varies greatly across teams, whereas teamwork skills can generalize to many teams, regardless of their context; therefore, we will elaborate on specific teamwork skills that are necessary to address in team training, while still acknowledging the importance of successful taskwork.

Team Training

Team training is a set of theoretically driven and empirically based interventions aimed at improving teamwork in organizations (Salas et al., 2015). Training for teamwork-based attitudes, behaviors, and cognitions (ABCs) is necessary for a team to be an effective and productive unit (Goldstein & Ford, 2002). The training literature differentiates team training from both team building and individual training (Salas et al., 2015). Team-building activities, such as rope courses, retreats, and icebreakers, are often equated with team training, but they do not provide the same benefits. They have been shown to clarify and define team roles (Shuffler, Burke, Kramer, & Salas, 2012), but their overall effectiveness is still questionable and not nearly as beneficial as team training (Buller, 1986; Tannenbaum, Beard, & Salas, 1992; Woodman & Sherwood, 1980). Team training, on the other hand, focuses on teamwork KSAs such as information sharing, cooperation, and shared mental models, which have all been found to enhance team performance (DeChurch & Mesmer-Magnus, 2010; Mesmer-Magnus & DeChurch, 2009). Team training also has unique objectives that do not align with individual training. Simply training individuals about the taskwork in a group setting will not help them in figuring out how to operate at the *team* level—this would not be considered team training (McIntyre & Salas, 1995; Stout, Salas, & Caron, 1994). Team training focuses on improving outcomes that depend on every individual team member to contribute in order to be successful (Stout, Cannon-Bowers, & Salas, 1996).

Lifespan of Team Training

Now we will cover the lifespan of effective team training: (1) before developing a training program (i.e., creating a positive climate and incorporating a needs analysis to identify necessary competencies), (2) during the development of a training program (i.e., using science-based design and delivery methods), and (3) after developing training (i.e., evaluating the training program and sustaining the trained teamwork behaviors). Figure 12.1 displays the key questions that are addressed for each phase.

Before Training

Prior to training, the organization must be ready for training and determine what needs to be trained. Below we elaborate on fostering organizational support and conducting a needs analysis.

IS THE ORGANIZATION READY TO TRAIN THEIR TEAMS?

Team training is a cooperative effort. As such, the first factor that should be addressed is the organizational

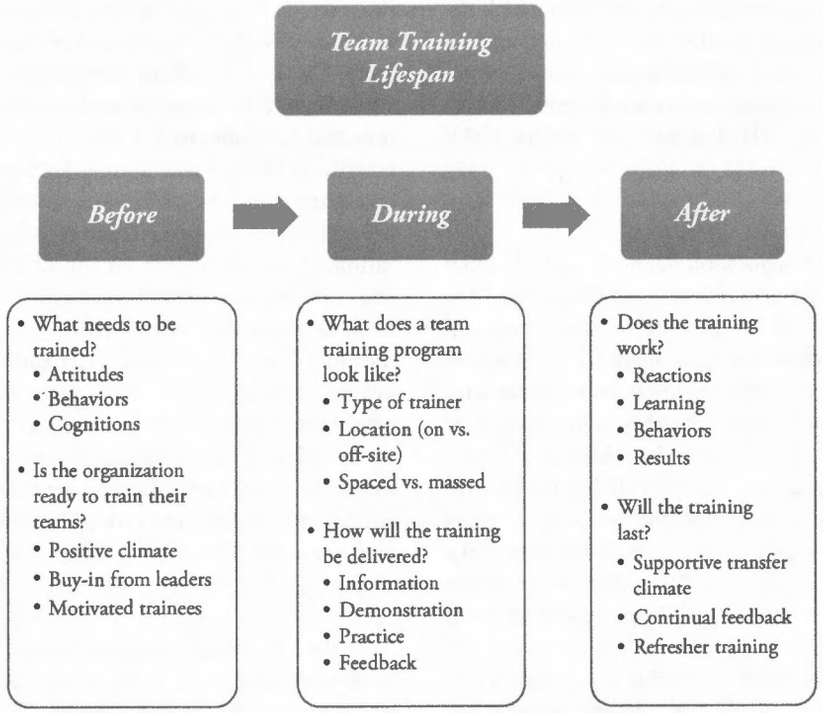

Figure 12.1 Team training lifespan.

climate in which the training will occur (Goldstein & Ford, 2002). Organizational climate refers to how supportive an organization is during the needs analysis and subsequent training (Goldstein & Ford, 2002). Organizational support is a critical component of training that can produce either success or failure of the needs analysis process as well as the overall training program (Goldstein & Ford, 2002). Building organizational support is best facilitated through garnering trust from all parties involved in gathering information relevant to the analysis process. A supportive organizational climate impacts other critical components required for effective team training, such as feedback delivery and engagement (Salas, Burke, & Cannon-Bowers, 2002).

Salas and colleagues (2015) stated that the training developer must "ensure that the delivery spot [recipients of training] is optimally prepared to receive team training—in other words, the delivery of team training should go off seamlessly" (p. 31). A key to doing so is increasing trainee motivation. If a trainee is not motivated to learn, then training will likely have no effect on him or her. To be confident that the trainees will engage in the team training program, a trainer should make sure that the trainees want to learn and that they believe that the training will benefit them (Salas et al., 2015). A trainee's motivation can be increased through enhancing its perceived valence (the extent to which the outcome is desired), instrumentality (the extent to which the training is necessary for the outcome), and expectancy (the extent to which the training can be completed successfully and lead to the outcome) (Mento, Locke, & Klein, 1992; Pritchard & Sanders, 1973; Vroom, 1964).

How Can We Motivate Trainees?

The answer to this question lies both in the broader organization and the training program itself. The organization needs to provide opportunities on-the-job to perform what was taught in the program. If trainees feel as if the organization does not support the training objectives, they will most likely disregard it as meaningless. Therefore, it is necessary for the organization to provide full support for the team training program. The best way to create organizational support is through the leaders of the organization (Bunch, 2007). If the leader shows buy-in, then the trainees will be more convinced of its importance.

It is also necessary to provide a psychologically safe environment. If the environment makes trainees feel unsafe or uncomfortable, then they will not let their guard down. They need to be open to learning and making errors during training in order to obtain the maximum benefit from it. Edmondson (2003) asserts that psychological safety facilitates an environment in which team members feel more comfortable speaking up, discussing performance, and providing solutions to challenges that the team encounters. Edmondson (1999) also found that psychological safety was significantly related to team learning behavior and that the relationship between psychological safety and team performance was mediated by team learning behavior. These findings support the role that psychological safety plays in both team-level learning and performance. A psychologically safe environment allows the trainees to feel secure and express themselves and overcome learning anxiety (Edmondson, 1999). It has also been shown to provide many other benefits, such as fostering knowledge exchange between participants, building shared mental models, and more (e.g., Bradley, Postlethwaite, Klotz, Hamdani, & Brown, 2012; Edmondson & Lei, 2014; Gerpott, Wenzel, Lehmann-Willenbrock, & Voelpel, 2015; Kahn, 1990; Liang, Farh, & Farh, 2012; Nilsen & Ludvigsen, 2010).

WHAT NEEDS TO BE TRAINED? CONDUCT A NEEDS ANALYSIS

Preceding the implementation of any training program, it must be established that team training methods can appropriately address the needs of the team. This begins with assessing organizational-level variables, then proceeds to analyzing team-level factors, and concludes with addressing individual characteristics. The organizational-level analysis helps determine what part of the organization needs training and how it can be conducted within the organization. (For more details on this phase, see Wexley and Latham, 2002.) We will mainly focus on the team task analysis because this is specific to team training. The team task analysis addresses the following question: "Are the targeted competencies relevant to teamwork?" Once team training has been identified as a viable option to overcoming challenges the teams face, trainers must conduct an individual-level analysis addressing the question, "Who makes up the team?", and adjust the training accordingly.

Are the Targeted Competencies Relevant to Teamwork? The needs analysis uncovers the specific elements that the training should focus on. These elements are referred to most commonly as "team competencies" and are defined by Cannon-Bowers, Tannenbaum, Salas, and Volpe (1995) as:

> (1) the requisite knowledge, principles, and concepts underlying the team's effective task performance; (2) the repertoire of required skills and behaviors necessary to perform the team task effectively; and (3) the appropriate attitudes on the part of team members (about themselves and the team) that foster effective team performance. (p. 336)

A variety of competencies have been identified and categorized based on their relation to the attitudes, behaviors, and cognitions (ABCs) that impact team performance. This classification scheme reveals the complex network of processes and emergent states that can influence training effectiveness in the context of teams (see Table 12.1). We will now cover some ABCs that have been recognized as trainable and pertinent to team performance.

Attitudes

A team member's feelings or attitudes toward the task and his or her fellow team members can have an impact on teamwork and team-related outcomes (Gregorich, Helmreich, & Wilhelm, 1990; Mullen & Copper, 1994; Prichard & Ashleigh, 2007). Prichard and Ashleigh (2007) investigated the training of team skills in sixteen three-person teams and found that affective components, such as level of trust and motivation, were significantly higher for teams that received training than for teams that did not receive training. From a broader perspective, a meta-analytic investigation identified trust, perceptions of communication and coordination effectiveness, socialization, and collective efficacy as affective constructs relevant to the training process at the team level (Salas et al., 2008). Furthermore, this meta-analysis found that team training programs were positively related to these attitudinal outcomes (Salas et al., 2008). Regarding more stable dispositional affective traits, collective orientation (i.e., an individual's inclination to be receptive to his or her team members and view their contributions as important) has also received attention as another individual difference impacting team performance (Driskell & Salas, 1992). Driskell and Salas (1992) also found that collective orientation enhances team task completion in comparison to teams that were less collectively oriented.

Behaviors

Team members' attitudes and cognitions are manifested in the form of behaviors. Understanding what team members must do in order to successfully work together to achieve shared goals and objectives is imperative to performance. Fortunately, there is a robust body of evidence surrounding behavioral competencies and their relationship to team-related outcomes and overall functioning (Salas et al., 2005). Drawing again from Salas and colleagues' (2008) meta-analysis, communication, coordination, decision making, and situational awareness were identified as behavioral constructs pertinent to team training. Smith-Jentsch, Cannon-Bowers, Tannenbaum, and Salas (2008) examined self-correction, another behavior critical to team functioning, finding that self-correction within teams can enhance performance outcomes.

Team leadership has been identified as another core behavioral team competency that is essential to team training and effectiveness (Hinsz, Tindale, & Vollrath, 1997; Smith-Jentsch, Zeisig, Acton, & McPherson, 1998). In support of this, researchers assert that team leadership can impact team adaptability (Burke, Stagl, Salas, Pierce, & Kendall, 2006), as well as team problem-solving capabilities and coordination strategies (Salas, Burke, & Stagl, 2004). Finally, team training programs targeting improvements in communication, another key behavioral competency, were found to improve performance in comparison to an untrained control group (Siegel & Federman, 1973).

Cognitions

Research on team training, in the context of improving performance, has recognized the importance of teams developing specific knowledge-based competencies in order to coordinate their members' efforts (Mohammed & Dumville, 2001) and ability to interact effectively (Cooke et al., 2000). The need for team members to develop *shared cognition*, also referred to as shared mental models, has been made salient by Cooke and colleagues (2000) in a review of the team measurement literature. Shared cognition is defined by Cooke et al. as "the collection of task- and team-related knowledge held by teammates and their collective understanding of the current situation" (2000, p. 154). Shared mental models impact many behavioral competencies important to team functioning, such as adaptability (Entin & Serfaty, 1999), coordination (Mohammed & Dumville, 2001), and shared situation awareness (Stout, Cannon-Bowers, Salas, & Milanovich, 1999). Entin and Serfaty (1999) found that shared mental models can impact a team's ability to adapt in response to novel environments.

Table 12.1 Overview of Teamwork Competencies (ABCs)

	Competency	Definition	Previous Research
Attitudes	Motivation	The expressed desire, strength, and direction of effort towards achieving training goals and objectives	Salas & Cannon-Bowers, 2000
Mutual Trust	A belief, grounded in honesty and competence, that the team is able to work together effectively as a unit	Prichard & Ashleigh, 2007; Bandow, 2001; Simons & Peterson, 2000	
Collective Orientation	Overall receptivity coupled with the belief that input from fellow team members is important	Driskell & Salas, 1992	
Preference for Teamwork	The inclination for an individual to prefer to work within a team rather than individually	Bell, 2007	
Collective Efficacy	The belief that the team possesses the necessary capabilities and can interact effectively with one another to accomplish a goal	Brown, 2003	
Behaviors	Shared Situational Awareness	The degree to which teams understand their surroundings in a given situation	Salas, Prince, Baker, & Shrestha, 1995
Coordination	The process by which teams strategize and execute actions pertaining to interdependent tasks assigned to the team	Prichard & Ashleigh, 2007; Entin & Serfaty, 1999	
Adaptability	Changes in behavior in response to changing environmental stimuli or novel tasks	Entin & Serfaty, 1999; Burke et al., 2006	
Communication	The exchange and interpretation of information among team members	Prichard & Ashleigh, 2007; Siegel & Federman, 1973	
Conflict Resolution	The process teams engage in to navigate interpersonal issues or disagreements	Simons & Peterson, 2000	
Team Leadership	The capacity to facilitate the exchange of information, organize the team, coordinate efforts, delineate task assignments, and promote the development of teamwork KSAs	Salas et al., 2005; Smith-Jentsch, Zeisig, Acton, & McPherson, 1998; Cannon-Bowers et al., 1995	
Backup Behavior	Assisting or fully assuming responsibility for a team member's task	Salas et al., 2005; Dickinson, & McIntyre, 1997	
Cognitions	Team Orientation	The inherent disposition for a team member to place a higher level of importance on the goals of the team in comparison to individual goals	Salas et al., 2005
Boundary Spanning Roles	The shared understanding of procedures associated with how members should interact with individuals outside of the team	Bell, 2007	
Shared Mental Models	The cognitive process involving the organization of knowledge structures that align with fellow team members understanding of team-related tasks and goals	Uitdewilligen et al., 2013; Cooke et al., 2000	

To expand on this investigation, Entin and Serfaty (1999) employed team adaptation and coordination training (TACT) and discovered that effective performance under stressful situations was best facilitated through the development of shared mental models. Moreover, team members must also possess accurate knowledge of their own role within the team as well as the roles of fellow team members. This role knowledge allows team members to coordinate through developing a shared understanding of expectations and responsibilities.

Who Makes Up the Team? To train teams effectively, individual characteristics must also be taken into account (Lacerenza & Salas, 2014). Though emergent states and characteristics of the team are important to performance, members' personality traits, measured at either the individual or the team level (e.g., mean level of extraversion present on the team), can also influence performance. Researchers have investigated personality traits in an effort to understand the relationship between these traits and performance outcomes. Bell (2007) revealed in a recent meta-analysis that Big Five traits such as Conscientiousness and Openness to Experience, on the team level, predicted team performance in applied settings. This meta-analysis also revealed the predictive capacity of collectivism and preference for teamwork on team performance (Bell, 2007).

Beyond this, three personality traits have dominated work on team training: (1) goal orientation, (2) self-efficacy, and (3) motivation. Goal orientation refers to an individual's propensity to set goals in an effort to either enhance learning or appear superior to others. Two types of goal orientations have been identified: *learning*, or *mastery*, and *performance* (Fisher & Ford, 1998; Phillips & Gully, 1997). Learning-oriented individuals perform better on tests of knowledge in comparison to their performance-oriented counterparts (Fisher & Ford, 1998). According to Kozlowski and colleagues (2001), "performance-oriented individuals seek easy situations that ensure positive evaluations of their capabilities, preferring to avoid novel or challenging achievement situations. Because they self-evaluate relative to others and view their capabilities as more stable, failure to achieve reflects negatively on the self" (p. 4).

Moreover, Kozlowski and colleagues (2001) found that self-efficacy was a significant predictor of adaptive performance. Self-efficacy refers to an individual's belief in his or her own capabilities (Bandura, 1977). Research has also demonstrated that self-efficacy is related to a learning orientation (Kozlowski et al., 2001), which has been found to promote more effective approaches to learning (Chen, Gully, Whiteman, & Kilcullen, 2000). In regard to motivation, Mathieu, Tannenbaum, and Salas (1992) found that an individual's level of motivation to participate in training positively predicted learning outcomes when the trainee held a positive perception of the program.

Finally, the team's overall level of cognitive ability is also relevant. The team's combined intelligence can have important implications for skill acquisition (Day et al., 2005) and performance (Woolley, Chabris, Pentland, Hashmi, & Malone, 2010). Day and colleagues (2005) manipulated team composition based on cognitive ability, generating high-, mixed-, and low-ability dyads to examine how intelligence can impact performance in the context of teams. As would be expected, researchers found that the high-ability teams performed best, but an interesting result from this experiment pertained to the mixed teams (i.e., teams comprised of both high- and low-ability individuals). Over time, high-ability members in the mixed teams individually outperformed their team as a whole. This finding supports the significance of team composition as it relates to achieving desired learning outcomes at the team and individual level (Day et al., 2005). Woolley and colleagues (2010) found that when group members work together, a form of collective intelligence emerges that is not merely the aggregate of individual members' intelligence, but a different emergent intelligence unique to the group. This form of collective intelligence was found to be influenced by members' average level of intelligence as well as their interpersonal dynamics. Building from these findings, Woolley and colleagues also found that collective intelligence was a significant predictor of group performance.

During Training

Once a positive training climate is established, the next step is to figure out how the training program should be designed and delivered. Below we elaborate on evidence-based design and delivery methods, and provide a few exemplary programs.

WHAT DOES A TEAM TRAINING PROGRAM LOOK LIKE?

First and foremost, the team training program should always follow the guidelines of scientific-based evidence (Salas et al., 2015). It needs to have

maximum *accessibility* (it is available to all learners who need training); *usability* (it is designed at a level that learners can understand); and *learnability* (it helps perform targeted ABCs) (Salas et al., 2015). The design of the team training program should also be relevant and engaging, which is accomplished through psychological and physical fidelity (Bowers & Jentsch, 2001).

Psychological fidelity is the extent to which the content of the training program matches the work environment. It refers back to the motivation discussion of expectancy. Trainees will be more likely to engage in a training program if they feel that it has a strong purpose and can be transferred to the workplace. The teamwork ABCs taught in the training environment should match the ones needed in the team environment (Bowers & Jentsch, 2001). Physical fidelity, on the other hand, refers to the extent that the training environment reflects the work environment. For example, aviators practice their skills in a lifelike airplane cockpit, which is a high physical fidelity training environment. Although physical fidelity is useful, it is not as important as psychological fidelity when learning teamwork competencies (Salas et al., 2015).

There are a number of design elements that the developer needs to consider, including the length and location of the training and who will deliver it. Training programs can be conducted using either spaced or massed practice sessions. Spaced, or distributed, programs break up the training into different sessions, whereas massed training programs have a single nonstop session. Research has found that spaced sessions lead to better transfer than massed training, most likely because they provide trainees with a period to rest without feeling overwhelmed and fatigued (Wexley & Latham, 2002). There is also the option of providing trainees with control of when and what they learn, known as active learning. Bell and Kozlowski (2008) emphasized the importance of having a learner-centered approach because it provides flexibility and encourages exploration. (For specific examples of the core training elements of active learning interventions, see Bell & Kozlowski, 2008.)

The location of the training can either be on- or off-site of the organization. There is little research on which location generates better outcomes (Wexley & Latham, 2002). However, on-site training can facilitate on-the-job training, which provides trainees with realistic practice opportunities (Arthur, Bennett, Edens, & Bell, 2003). Also, off-site training tends to be more costly, in which case on-site training could result in a better return on investment (Arthur et al., 2003; Avolio, Avey, & Quisenberry, 2010). Related to the location is deciding who will facilitate the training. Training instructors can be from within the organization or outside the organization, known as internal trainers and external trainers, respectively. The literature is inconclusive on which type of instructor is more effective. There has been support for both internal (McCormick, 2000; Teckchandani & Schultz, 2014) and external (Culpin, Eichenberg, Hayward, & Abraham, 2014; Jorgensen & Els, 2013) instructors. These are not the only options for facilitation. A training program can also be self-administered. Self-administered programs require more motivation on the trainee's part (Blume et al., 2010), but they also allow for a more customized and learner-centered approach (Bell & Kozlowski, 2008). With the use of advanced technology, it is possible to make self-administered programs more engaging.

Technology-Based Training

As technology increases, the design of training programs has been shifting from traditional training to technology-based training. Simulations are more advanced and realistic than ever! Simulations are particularly beneficial for replicating complex environments that would be expensive or dangerous to actually practice in (Heinrichs, Youngblood, Harter, & Dev, 2008). Ricci, Salas, and Cannon-Bowers (1996) investigated the effects of a computer-based game and found that retention was higher for participants in the gaming condition compared to the paper-based condition. They also found that participants reacted more favorably (i.e., provided higher ratings of enjoyment and effectiveness) to the computer-based game. However, this attractiveness should not distract training developers from the importance of psychological fidelity. Moreover, developers must acknowledge the short- and long-term costs of using a technology-based approach. The return on investment can help determine if a high physical fidelity approach is necessary to use.

Also, the training technology needs to be simple and straightforward to operate to maximize usability. Training developers need to make sure that the trainees have previous experience with similar technology, and, if not, they should provide trainees with practice prior to the team training program. As Salas and colleagues (2015) assert, "the best training platform in the world is essentially useless if it is so excessively difficult to learn or operate that learners become unwilling to use it" (p. 74).

HOW WILL THE TRAINING BE DELIVERED?

The training literature has identified three broad types of delivery methods: information based, demonstration based, and practice based (Salas & Cannon-Bowers, 2000; Weaver, Rosen, Salas, Baum, & King, 2010b). All these delivery methods have been extensively used in training (Goldstein, 1993). Information-based training includes lectures, presentations, and reading materials. Demonstration-based training includes watching real-life situations on video or in person. Lastly, practice-based training, which is seen to be the most impactful, involves role playing, on-the-job training, in-basket exercises, and simulations (Weaver et al., 2010b). Practice-based training is the most engaging, and it allows trainees to apply what they are learning in a realistic, yet safe, environment in order to fully grasp the content (Weaver et al. 2010b). A training program can use one, two, or a combination of all three methods in a single program. Researchers have examined the utility of all three methods, both alone and in combination, in an effort to determine their utility and effectiveness in the context of team training (Buljac-Samardzic, Dekker-van Doorn, van Wijngaarden, & van Wijk, 2010). Evidence indicates that using a combination of all of these methods is the most effective (Taylor, Russ-Eft, & Chan, 2005; Zapp, 2001). An example of this is a team training program delivered to five diverse surgical facilities across the United States by Marshall and Manus (2007) that contained workshops using video examples and role play to present the ABCs necessary in the current health care industry. Although these general delivery methods have stayed the same over time, Salas and Cannon-Bowers (2000) argued that new applications (e.g., distance learning), implementations (e.g., computer-based training), and combinations (e.g., intelligent computer-assisted instruction) have arisen. Table 12.2 displays a list of common instructional strategies along with their characteristics.

Feedback

Another instructional strategy that should not be overlooked is the implementation of feedback. The best feedback is delivered immediately and contains content that is specific to the team (Lacerenza & Salas, 2014). Highlighting the need for feedback to be constructive in nature, feedback should refer to both negative and positive aspects of team performance (Ellis & Davidi, 2005; Smith-Jentsch, Cannon-Bowers, Tannenbaum, & Salas, 2008). The content of feedback should address both team interactions that occurred during the performance episode and outcomes resulting from these interactions as they impact the overall training objective (Salas, Burke, & Cannon-Bowers, 2002). Moreover, feedback should be accurate and task specific, keeping the focus on the teamwork (and taskwork) involved directly in mission completion (Salas et al., 2002). Feedback can be classified as either subjective or objective. Subjective feedback is based on an outsider's (typically the supervisor's) view of the team's performance; objective feedback uses unbiased statistics or data on the team's performance as it performed the task (Villado & Arthur, 2013). Examples of objective feedback are video recordings, audio recordings, or automated printouts documenting specific aspects of task completion. Both types of feedback (i.e., subjective and objective) have been found to be effective at enhancing performance (Villado & Arthur, 2013).

EXAMPLES OF TEAM TRAINING PROGRAMS

Now that we have described important aspects of the design and delivery of team training programs, here are a few examples of existing programs that have successfully implemented these characteristics.

TeamSTEPPS: Team Strategies and Tools to Enhance Performance and Patient Safety

In an effort to improve patient safety through the use of teamwork, the Agency for Healthcare Research and Quality (AHRQ) and the Department of Defense (DoD) developed Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS™). TeamSTEPPS is based on more than 20 years of research on teamwork and training in health care and has been implemented in more than 68 facilities, training more than 5,000 staff members (King et al., 2008). It was released in 2006 and has become the national standard for health care team training (King et al., 2008). It focuses on the interdisciplinary component of health care teams. Individuals from different disciplines and educational programs (e.g., physicians, pharmacists, nurses) need to take on specific roles while achieving a common goal.

First, the developers identified teamwork competencies such as team leadership, backup behavior, mutual performance monitoring, adaptability, and shared mental models. Then they categorized these as either trainable or a competency that would result from a trainable skill (e.g., shared mental models is an outcome of learning trainable skills like backup behavior). The instructional framework

Table 12.2 Instructional Strategies

Strategy	Definition & Characteristics	References
Crew Resource Management Training (CRW)	"Instructional strategies designed to improve teamwork in the cockpit by applying well-tested training tools (e.g., performance measures, exercises, feedback mechanisms) and appropriate training methods (e.g., simulators, lectures, videos) targeted at specific content" • Focus on coordination • Feedback takes place after exercise • Aviation setting has practiced for over three decades	Salas et al., 1999, p. 163; Lauber, 1984 Volpe et al., 1996, p. 87; Marks et al., 2002
Cross-Training	"An instructional strategy in which each team member is trained in the duties of his or her teammates" • Develop shared mental model • Allows for teamwork to take place without overt communication • Increases flexibility	Blickensderfer et al., 1997; Smith-Jentsch et al., 2008; Edwards et al., 2006
Guided Team Self-Correction Training	Instructional strategy that formalizes the natural process of tendency for teams to self-correct • Improve KSAs without interference of an instructor • Review past events and errors to provide a) feedback to each other • Develop effective approaches for future events	Dwyer et al., 1999; Fowlkes et al., 1994; Johnston et al., 1995
Event-Based Approach to Training (EBAT)	Instructional strategy that involves simulations and "trigger" events to provide opportunities to practice teamwork KSAs for complex and distributed teams • Links multiple simulators across locations for the same exercise • "Trigger" events situated throughout exercise that target objective competencies • Useful for aviation settings, tactical team decision-making settings, and multiservice distributed military environments	Salas et al., 2002; Chen et al., 2004; Ellis et al., 2005
Generic Teamwork Skills Training	Instructional strategy that trains teamwork skills that can be adapted to a variety of tasks and environments rather than task-specific competencies • Focus on conflict resolution, collaborative problem solving, communication, goal setting and performance management, and planning and task coordination • Useful for project teams that change tasks regularly	

identified leadership skills, situation monitoring, mutual support, and communication as the core competencies for TeamSTEPPS. Each of these competencies has a didactic-based module defining the competency and identifying tools and strategies to improve in the competency.

TeamSTEPPS occurs in three critical phases based on experience, scientific literature, and culture change. Phase 1 is the needs analysis. As mentioned earlier in the chapter, preceding the implementation of any training program, a needs analysis must take place in order to see if team training will provide a solution. The organization must have supportive leaders who are dedicated to changing the organizational culture for the better. Within the needs analysis, the organization needs to recognize the problem at hand and why it is occurring to help identify what specific interventions are needed (details on this phase are discussed in the needs analysis section of this chapter). The pretraining assessment provided by TeamSTEPPS also helps the organization identify its readiness level for employing TeamSTEPPS. If the readiness level is low, it is unlikely that the training program will be beneficial for the team. In this case, organizations are encouraged to follow specific tips on enhancing organizational readiness and then retake the pretraining assessment a few months later.

Phase 2 is dedicated to the planning, training, and implementation of TeamSTEPPS. Once the problem and the strategies to solve it are identified in the needs analysis, then Phase 2 follows the subsequent steps listed next. (For a detailed explanation of each step, visit http://www.ahrq.gov/teamstepps/.)

1. Define the TeamSTEPPS intervention.
2. Develop a plan for determining the intervention's effectiveness.
3. Develop an implementation plan.
4. Gain leadership commitment to the plan.
5. Develop a communication plan.
6. Prepare the institution.
7. Implement training.

A customized implementation of the TeamSTEPPS intervention is created along with an action plan and the actual execution of the training. The first decision to make is whether the training will be conducted as "whole training" or in "doses," referred to earlier as massed and spaced training, respectively. Whole training occurs when the training takes place all at once, and "dosing" occurs when there are multiple interventions with specific tools for each one. To verify the effectiveness of the training, there must also be a plan for evaluating the intervention. The purpose of this phase is to prepare the organization and tailor the training for its specific needs.

Phase 3, the final stage of the TeamSTEPPS intervention, focuses on sustainment of the training. After training occurs, staff members should still be provided with opportunities to practice and utilize the skills in day-to-day procedures. Regular feedback and praise when staff members have successfully worked as a team help maintain the skills taught. During this phase, ongoing evaluation should also take place and any needs that have changed should be addressed in a revision plan to make sure the intervention is focusing on the necessary organizational needs.

Team Dimensional Training

Team dimensional training (TDT) is another well-validated intervention for team training (Smith-Jentsch, Cannon-Bowers, Tannenbaum, & Salas, 2008; Wildman & Bedwell, 2013). This type of team training guides the team through prebriefs and debriefs where they discuss examples of four main competencies (i.e., information exchange, communication delivery, supporting behavior, and leadership/followership). Team members can review past events and summarize everything that took place in the team. Another element of the training is identifying errors and exchanging feedback. Teammates acknowledge mistakes they have made and provide developmental feedback to each other when they notice that someone has made an error. There is also a focus on planning for future events. Trainees work together to develop new approaches to how they perform a task based on the errors noticed, feedback gained, and expectations stated.

Smith-Jentsch and colleagues (2008) conducted a study to assess the effects of TDT that was based on an expert model-driven guided team self-correction approach. They compared the more formalized approach to a less participative and chronologically organized approach within US Navy command and control teams. The study showed support for the idea that merely providing teams with the opportunity to debrief is not as effective as a formalized approach. This has also been shown in previous studies in regard to facilitating shared team cognition (e.g., Edwards, Day, Arthur, & Bell, 2006; Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000). Specifically, these studies found that the formal approach created more accurate mental models of teamwork and stimulated more effective teamwork processes and outcomes than the informal approach (Smith-Jentsch et al., 2008).

Crew Resource Management Training in Aviation

Crew resource management (CRM) training has been implemented by commercial and military aviation for over three decades to improve safety in the cockpit and enhance team performance (Salas, Wilson, Burke, Wightman, & Howse, 2006b). CRM training can be defined as "instructional strategies designed to improve teamwork in the cockpit by applying well-tested training tools (e.g., performance measures, exercises, feedback mechanisms) and appropriate training methods (e.g., simulators, lectures, videos) targeted at specific content (i.e., teamwork knowledge, skills, and attitudes)" (Salas et al., 1999, p. 163). To develop this type of program, first, one must identify the necessary CRM competencies in a needs analysis. Along with a theory-based rationale for the specific teamwork ABCs that are going to be addressed in training, it is also necessary to determine what to measure and how to measure it. Once training objectives are created, the delivery method is chosen; typically exercises that give trainees a chance to practice the

targeted competencies are used. After completing the exercise, positive and negative feedback is provided so that trainees can be aware of their effective and ineffective behaviors. Afterward, training evaluation is conducted. Finally, a positive climate needs to be established in order to reinforce the behaviors learned. The outcome of the training should result in fewer errors and improved safety. (See Salas, Wilson, Burke, Wightman, & Howse, 2006b, for a detailed checklist on developing CRM training.)

The success of CRM training has been evident in aviation. For example, Salas and colleagues (1999) noted that there was as much as a 20% increase in teamwork behaviors when the strategy was used. Salas and colleagues (2006a) reviewed the state of CRM training as it expanded to other domains (e.g., medicine, offshore oil production and maintenance, shipping/maritime, and nuclear power domains) and stated that, while it does result in positive trainee reactions, the learning and behavioral changes are not consistent across domains. Salas and colleagues (2006a) suggested that this inconsistency is due to the lack of standardization for what competencies should be developed by CRM training, as well as a need for appropriate performance measurements. Another issue is that organizations sometimes pay more attention to the physical fidelity of the program than to the context of the training. The appeal of having a training program with lifelike simulations that are high in physical fidelity should not take away from the psychological fidelity that is required to properly transfer the training.

Although the findings in nonaviation domains are inconclusive, this is perhaps to be expected since they are relatively new at implementing CRM training. The aviation community has had over three decades to discover how to properly design, implement, and manage this type of team training program. Salas and colleagues (1999, 2006a) argued that CRM training can be successful across domains, but organizations must use the relevant literature to guide their efforts.

After Training

Team training does not stop at the end of the training phase of the program. After delivering training, attention should be given to evaluation and sustainment of the outcomes.

DOES THE TRAINING WORK? EVALUATE THE TRAINING

Training evaluations are a vital part of the process of training (Salas & Cannon-Bowers, 2000), because they can shape the development of further training programs (Salas et al., 2015). If a team training program produces no improvement in a desired teamwork skill (e.g., adaptability) when the program is evaluated, then steps can be taken to modify the program for future trainees. Training evaluations should be implemented at multiple periods to ensure that the training program remains effective over time. As a team changes, the skills needed for the team can change (e.g., a team can increase the amount of virtual interactions) (Salas et al., 2015). Some years ago, Cannon-Bowers and Salas (1997) provided key characteristics that an evaluation system needs, and these still hold true today.

A team training evaluation system must:

- Be theoretically driven
- Assess and diagnose team performance
- Address team outcomes as well as processes
- Capture individuals' moment-to-moment attitudes, behaviors, cognitions (ABCs)
- Consider multiple levels of analysis
- Consider multiple methods of measurement
- Provide a basis for remediation
- Rely on observation by experts

We will first discuss *what* needs to be measured (i.e., the outcome variables related to team performance) and then we will elaborate on necessary components of a team training evaluation, such as *how* teams are measured and *who* should evaluate the team.

The most widely used guide for evaluating a team training program is Kirkpatrick's (1959) framework, which identifies the desired outcomes that a training program aims to accomplish: trainee reactions, learning, transfer of training, and results (Kirkpatrick, 1959). Trainee reactions encompass the trainee's opinion of the program, such as how important or engaging he or she found it to be. Trainee learning is the increase in the trainee's specific knowledge, skill, or attitude that was targeted in the training. Trainee transfer of training is how well the trainee used what he or she learned in the workplace. Transfer is measured by on-the-job behavior that takes place after training. Results include the trainee's later productivity (e.g., amount of sales), tenure in the organization, and absenteeism. All of these levels are important to consider when determining the effectiveness of a team training program.

Team training evaluations typically utilize an input-process-output perspective on team performance. This framework posits that team processes translate team inputs (e.g., personality traits, team characteristics, organizational characteristics) into team outcomes (e.g., performance, effectiveness, members' reactions). Team processes play an important role in team performance because they demonstrate how the team members work interdependently to accomplish their collective task (Marks, Mathieu, & Zaccaro, 2001). Team process is defined as "members' interdependent acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed toward organizing taskwork to achieve collective goals" (Marks, Mathieu, & Zaccaro, 2001, p. 357). The taxonomy of team processes developed by Marks, Mathieu, and Zaccaro (2001) identifies transition, action, and interpersonal processes that are particularly suitable for project, production, service, and action teams. This episodic approach differentiates behavior that occurs when the team is planning for future action, known as the "transition phase" (i.e., mission analysis, goal specification, strategy formulation, and planning), behavior that is directly related to accomplishing the team goal, known as the "action phase" (i.e., monitoring progress toward goals, systems monitoring, team monitoring and backup, and coordination), and behavior that reflects interpersonal relationships and dictates the success of the other processes, which occurs during both of the previous phases, known as "interpersonal processes" (i.e., conflict management, motivating and confidence building, and affect management).

Marks, Mathieu, and Zaccaro (2001) note that the teamwork competencies necessary in one phase may not be as important in another phase; therefore, when measuring teamwork skills, the phase in question should be kept in mind. For example, if the learning objective for the program is to improve coordination and backup behavior, then the measurement should target those specific learning objectives and focus on the action phase of the task, rather than measuring the team's behavior while planning during the transition phase.

In regard to *how* team performance is measured, typically self-report or observational methods are used. Self-report allows team members to rate themselves or the team as a whole. This is an easy approach to implement that does not require many resources. For example, attitudes, such as team orientation or psychological safety, can be captured using a Likert scale. With this approach, the team member can identify how he or she feels toward the team, ranging from strongly disagree to strongly agree. Attitudes are important to measure because they are associated with team performance (Hackman, 1990; Peterson, Mitchell, Thompson, & Burr, 2000; Salas, Sims, & Burke, 2005). Self-report is also suitable for measuring team knowledge because when the individual is tested on his or her knowledge, it is difficult to intentionally fake having more knowledge than he or she actually has. However, when using self-report to measure other variables, it is possible for individuals to provide answers that show themselves in a favorable light (Rosen et al., 2012).

Observations are the most commonly used method for objective measurement of team performance. This can be done through event-based tools (Rosen et al., 2012), real-time assessment, and behavioral rating scales. The event-based approach provides practice scenarios that allow specific behaviors to be observed. This approach lets the assessor design events specific to the behaviors needing to be evaluated. Having control over the events enhances the measurement reliability. For example, a training program that focuses on effective communication for a flight crew can use a typical scenario event, such as delivering cargo, which allows the observer to notice behavior that reflects this skill, such as using standard terminology. Two training techniques developed using the event-based approach to practice and measure teamwork skills are Targeted Acceptable Responses to Generated Events or Tasks (TARGETS) (Fowlkes et al., 1994) and team dimensional training (TDT) (Smith-Jentsch, Zeisig, Acton, & McPherson, 1998).

Another effective behavioral measurement technique is real-time assessment (Sottilare, Holden, Brawner, & Goldberg, 2011). For example, a technology-based system called Synthetic Cognition for Operational Team Training (SCOTT), designed for a Navy crew, uses a computer avatar, or "synthetic instructor" who serves as a coach. The SCOTT system is a technology-based simulation designed to diagnose and provide feedback to the trainee during the training program (Zachary, Santarelli, Lyons, Bergondy, & Johnston, 2001). This has a quick turnaround for capturing data, analysis, and providing feedback to the trainees.

Perhaps the most frequently used approach involves behavioral rating scales because they focus on observable behaviors rather than the rater's judgments of team members' traits or qualities (Farr & Levy, 2007). Rating scales include behavioral observation scales (BOSs), graphic rating scales, and behaviorally anchored rating scales (BARSs). BOSs require raters to record the frequency of desired behaviors for the job that the organization expects of the trainee. Graphic rating scales use a list of relevant traits required for the job. The rater scores the

trainee on each behavior using a scale that ranges from low to high performance.

The most commonly used rating scales are BARS, introduced by Smith and Kendall (1963). This method uses critical incidents (i.e., relevant positive and negative events that can occur on the job) to determine the performance dimensions. Similar to a graphic rating scale, the rater scores the trainee on his or her performance for a specific behavior. However, the scale also has a narrative that outlines what the anchors mean. Rather than simply being rated from "1 = no skill" to "5 = complete skill," the behavioral rating scale will have examples of what each anchor entails. For instance, if the rater is evaluating a team member's coordination skills, "1 = no skill" would be followed by examples of poor coordination such as "decisions were made without the input of the team" and "the team member did not know what was going on."

Regardless of the method chosen, the literature advises that the approach should not distract the trainees (Cooke, 2015) and that "the basic psychometric properties should be established and monitored (i.e., reliability and validity evidence)" (Rosen et al., 2013, p. 75). Because every method has its strengths and weaknesses, it is also best to triangulate. Using a mixture of self-report, peer assessments, and observations can provide multiple angles on the team's overall performance (Rosen et al., 2012).

In regard to *who* measures team performance when using observations, subject matter experts (SMEs) are needed. These are individuals who fully grasp the construct at hand. For example, a neurosurgeon is an expert in surgical team tasks. Expert raters are useful because they are familiar with the construct. However, because of their level of skill, they are less available to be used as observers. Although a neurosurgeon is an expert in a surgical team task, it is unlikely that he or she can take time out of work to rate others in a surgical team task. Therefore, observations often use nonexpert raters who are trained on the material. They can make similar ratings to experts once they are properly trained (Rosen et al., 2013). Raters should only be trained to focus on four or five constructs to avoid errors in ratings, such as allowing ratings from one skill to influence ratings of the other skills (Smith-Jentsch, Zeisig, Acton, & McPherson, 1998). When looking at more than five constructs that are related, the dimensions become indistinguishable and ratings tend to be highly correlated.

Because the number of constructs that can be measured is limited, developing the measure requires that the constructs be customized for the team. As previously mentioned, special attention needs to be given to the specific team processes that need development. The performance measurement should take into account idiosyncrasies of the team and other factors such as the team size and context. For example, when observing large teams, there should be multiple observers collecting information. Each observer should be assigned to rate one or two individuals on the team so that other interactions are not overlooked (Dickinson & McIntyre, 1997). For example, if a single observer is responsible for watching a team of five individuals, he or she may be paying attention to two members arguing and will fail to notice other important interactions between the other three teammates.

Prior to creating the team performance measurement, necessary competencies can be discovered by directly observing the team, using questionnaires, interviewing subject matter experts (SMEs), and reviewing printed job materials such as a job description. To get a better idea of the overall teamwork components, it is best to collect information from a variety of sources with different tenure. A team member with 10 years of experience will most likely have a different perspective on the team than will a new team member.

WILL THE TRAINING LAST?

Now that the design, development, and evaluation stages of the training program have been discussed, it is important to consider the training program's impact over an extended period of time. The long-term goal of implementing a team training program is to provide trainees with team-based ABCs that they will be able to learn and use on the job, known as *training transfer* (Blume, Ford, Baldwin, & Huang, 2010). Sustainment, in the training literature, involves the prolonged use of competencies that were transferred from the training environment to the work environment. When these ABCs are sustained over a long period of time, this is referred to as *maintenance*. Ensuring that these trained ABCs transfer and are sustained after training is critical. The work environment, and any change in the work environment over time, needs to be considered to ensure transfer and sustainment of trained ABCs (Blume et al., 2010; Goldstein & Ford, 2002).

First, the work environment that the team operates in should be taken into consideration. This environment is often referred to as the transfer climate, which takes organizational factors into account that impact the use of trained competencies on the job (Burke & Hutchins, 2007). A supportive work climate has been found to promote training transfer (Richman-Hirsch, 2001). Providing continual feedback on the team's performance after training has also been found to enhance transfer. In the same vein, the encouragement of constructive discussion among the team members surrounding what was learned during training can also work to facilitate transfer. In sum, giving team members opportunities to practice and providing feedback on their performance can enhance maintenance (Salas, Rozell, Mullen, & Driskell, 1999).

Second, time is a critical factor regarding sustainment (Kozlowski, Brown, Weissbein, Cannon-Bowers, & Salas, 2000). Assessing how individuals apply trained competencies to the job over time provides valuable insight into the extent (e.g., days, months, or years) that trainees are able to maintain what they learned during training. Also in relation to time, trainers should take organizational changes that occur over time into account and adapt training accordingly. Changes in organizational goals and objectives may require teams to undergo new training or refresher training to maintain ABCs required for effective performance (Kozlowski et al., 2000). Taken together, many of the same factors that contribute to a robust team training program design (e.g., feedback and opportunities to practice) are also beneficial to the transfer and sustainment of trained ABCs.

Lessons Learned

In this chapter, we covered the crucial events in the lifespan of effective team training: (1) before developing a training program (i.e., creating a positive climate and incorporating a needs analysis to identify necessary competencies), (2) during the development of a training program (i.e., using science-based design and delivery methods), and (3) after developing training (i.e., evaluating the training program and sustaining the trained teamwork behaviors). Valuable lessons can be learned from past team training endeavors. Many of these lessons are derived from team training efforts carried out in applied settings as well as the science of team training rooted in empirical research (see Table 12.3).

As is now apparent, a plethora of team training options are presently available. However, not all teams function in a similar fashion, and training methods must be selected to meet specific needs of particular teams. Based on the existence and successful implementation of a variety of team training programs, it is evident that a one-size-fits-all approach to team training is not effective (Salas et al., 2015). Salas and colleagues' (2008) meta-analytic investigation indicated that the level of effectiveness achieved by a team training intervention was contingent upon the outcome targeted by the program. The identification of competencies is another core element to the successful adoption of any team training program (Salas et al., 2015). Through identifying what attitudes, behaviors, and cognitions should be targeted, practitioners can tailor a training program to focus on central elements specific to the organization and teams nested within the organization.

Table 12.3 Lessons Learned

		References
I.	Base Training on Scientific Evidence	Salas et al., 2006b; Wildman & Bedwell, 2013
II.	Tailor Every Training Program	Hughes et al., 2016; King et al., 2008
III.	Conduct a Needs Analysis on Organizations, Teams, and Individuals	Arthur et al., 2005; Brown, 2002
IV.	Conduct Ongoing Training Evaluations	King et al., 2008
V.	Ensure Sustainment	Weaver et al., 2010a
VI.	Provide Immediate and Constructive Feedback	Lacerenza & Salas, 2014; Smith-Jentsch et al., 2008; Villado & Arthur, 2013

To avoid the one-size-fits-all approach, necessary steps must be followed to systematically select or design and develop a team training program. The first step in this process is to conduct a training needs analysis, which identifies the goals and objectives of the training program along with task and individual-level attributes that can impact training program implementation (Brown, 2002). In a recent review of health care team training, Weaver and colleagues (2010a) found that only 20% of studies included a training needs analysis. Though conducting such an analysis may have upfront costs, from an economic standpoint ensuring the success of a training program in the long term can outweigh the immediate cost to the organization.

Next, evaluating training program effectiveness is critical throughout the life cycle of the program. Utilizing a well-substantiated methodological approach when conducting these evaluations ensures that each facet of the program is captured and assessed (i.e., reactions, learning, behavior, and results)

(Kirkpatrick, 1959). Research demonstrating the effectiveness of a results-based approach has been found, but the other levels of Kirkpatrick's framework are also critical to painting a clear picture of the program's overall effectiveness. Salas et al. (2008) demonstrated this through findings supporting the link between medical professionals' behavior and subsequent patient outcomes. This link could only be found through a systematic training evaluation process, thus supporting the importance of evaluation at all levels. Furthermore, programs should be evaluated throughout the organization's usage of the program to ensure that it is consistently achieving organizational goals and objectives.

Another overarching concern for practitioners and researchers alike is sustainment, as was demonstrated through the discussion of the TeamSTEPPS program. Teams should be provided with opportunities to continually practice the competencies taught during training to ensure that ABCs do not decay over time (Weaver et al., 2010a). To aid in sustainment, members should be provided with feedback on their on-the-job performance while they use the trained KSAs. Receiving feedback provides team members with the opportunity to gain insight into their performance that facilitates the formulation of future plans and actions (Smith-Jentsch et al., 2008), and it has been identified as a critical component of team training in general (Weaver et al., 2010a).

The Future of Team Training

Teamwork has become a way of life in organizations. Teams are becoming more complex and dynamic. They are embracing diversity and becoming geographically dispersed. Team training strategies must evolve to fit the complexity and diversity of teams. Advances in technology can enhance team training methods. As performance assessment evolves real-time, diagnostic, and unobtrusive capabilities, these will support the growth of effective design and delivery of team training. Interventions and programs informed by the science of team training coupled with advances in the applied arena pave the way for more robust team training efforts moving forward. As organizations continue to grow, the need for teams and team training will follow. We hope that scientists and practitioners can build on this chapter as new challenges arise within team research.

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CHAPTER

13 Team Training in the Organizational Context

Norbert K. Semmer *and* Franziska Tschan

Abstract

Many formal and informal units at various levels provide a heterogeneous organizational context for team training. Consolidating and adapting newly acquired knowledge and skills needs time and resources, encouragement, and feedback. It also requires supportive messages that are consistent over time, across sources, and in terms of content (e.g., general value statements as compared to specific messages). Our chapter focuses on "transfer climate," characterized by transfer-related cues and consequences, supportive behaviors, and opportunities to perform. Discussing structural aspects, we emphasize aligning messages and actions with the goal of supporting transfer. Next we discuss the role of episodes, which unfold over time and give meaning to training. Finally, we discuss configurations, that is, specific constellations of influences not captured by studying the contribution of individual variables; we advocate focusing more strongly on the trainee perspective; and we emphasize fairness and appreciation as an overarching issue that may be decisive for transfer success.

Keywords transfer climate, heterogeneity, consistency of messages, social identities, learning culture, psychological safety, task design, configurations, fairness

Most authors would consider it a truism that an important aspect of teamwork is that teams are embedded in an organizational context and that this context influences most aspects of the team (e.g., Argote, McEvily, & Reagans, 2003; Arrow, McGrath, & Berdahl, 2000; C. S. Burke, Stagl, Salas, Pierce, & Kendall, 2006; Edmondson, Dillon, & Roloff, 2007; Forehand & von Haller, 1964; Katz & Kahn, 1978; Kozlowski & Ilgen, 2006; Kozlowski & Salas, 1997; Levine & Moreland, 1990; Mathieu, Maynard, Rapp, & Gilson, 2008; McGrath & Tschan, 2004). It follows that this "embeddedness" also applies to team learning and training (Argote, 2013; Edmondson, Bohmer, & Pisano, 2001; Kozlowski & Ilgen, 2006), as it does to individual training (Baldwin & Magjuka, 1997).

This chapter deals with the organizational embeddedness of team training. In describing and discussing pertinent issues, we will draw on literature related to team training (Kozlowski & Salas, 1997; Mathieu et al., 2008) but also on literature on individual training, which tends to discuss similar variables (Baldwin & Magjuka, 1997). Furthermore, we will draw on literature dealing with embeddedness of teams in general, as many processes discussed in that literature, again, are similar to those that are pertinent for team training.

A discussion of embeddedness, or the *context* for team training, requires an understanding of both teams and context. These issues may seem straightforward, but they are not. Following a brief overview of the organizational context of teams, we will discuss to what extent teams actually conform to common definitions of a team, and the implications of deviations from this concept (e.g., in terms of subteams and faultlines connected with social identities) for our topic. We then will discuss the heterogeneity of organizational contexts, arguing that these contexts consist of a multitude of individuals, teams, and units at several levels of an organization,