

First introduced at Boeing, an eight-step process for developing and implementing team-based on-the-job training has proven effective in a variety of industrial settings.

The Task Analytic Training System (TATS) was first used by Boeing Commercial Airplane Group's Fabrication Division to help the company's inspection teams develop, implement, and upgrade a comprehensive on-the-job training (OJT) program. Following the system's eight-step process has enabled the teams to provide continual first-time, recurrent, and remedial training as well as facilitate positive cultural change. Here's a primer on how it works.

TATS defined

The TATS model is a performance-based, hands-on approach to developing, implementing, and evaluating a structured OJT program that can be applied to a variety of manufacturing settings. The system is based on three interacting components that are essential to effective OJT: job-task analysis, job instruction training, and human factors principles. And because the

Model for Team-Driven OJT

In This Story

- ▼ on-the-job training
- ▼ program design and development
- ▼ teamwork
- ▼ training systems

team-driven system essentially replaces "degenerating buddy system" training approaches, such intangible benefits as improved training quality and procedures, improved morale, enhanced communication and decision making, and reductions in conflict are evident. In general, the process helps to instill mutual respect and trust, enhance goal-directed behavior, strengthen employees' self-esteem and responsiveness to new ideas, and encourage employees to make worthwhile contributions.

How TATS works

TATS is based on full workforce participation. During the system's development phase, key personnel are selected to shepherd the process, including a design team, an approval team, and a team facilitator.

The design team consists of at least three content experts. Their primary task is to perform a job task analysis and write training modules on the identified tasks.

Table 1: Roles and Responsibilities of Key Personnel

Design Team

- ▼ conducts task analysis
- ▼ creates and implements a project plan
- ▼ writes training modules (with performance objectives)
- ▼ verifies modules on site
- ▼ conducts workforce overviews
- ▼ obtains input from other workers
- ▼ selects approval team
- ▼ schedules periodic progress reviews with supervision

Approval Team

- ▼ meets with design team to be briefed on responsibilities
- ▼ helps design team verify modules on site
- ▼ meets with design team for TATS overviews
- ▼ approves modules, suggesting alternatives when appropriate

Facilitator(s)

- ▼ performs needs identification and discusses TATS process with workforce
- ▼ attends all design team meetings and works to build team cooperation, suggests alternatives, directs discussions, and helps resolve conflict
- ▼ writes on flipchart so that everyone can see
- ▼ teaches design team how to
 - write measurable objectives

- write training modules
- verify modules on site
- ▼ administers evaluation questionnaires and compiles data
- ▼ schedules and performs annual maintenance audit

Administrator

- ▼ copies modules from flipchart for design team review
- ▼ ensures that modules are typed and maintained in an organized manner
- ▼ coordinates additions, deletions, and/or corrections
- ▼ keeps manuals up to date and coordinates paperwork

Trainer

- ▼ serves on the design team if possible
- ▼ assists in module on-site verification
- ▼ maintains “hands-on” experience with modules
- ▼ helps to keep modules up to date
- ▼ conducts evaluation pre-meetings with trainees
- ▼ prepares for training sessions and conducts training
- ▼ appraises and documents performance
- ▼ meets with supervisors when appropriate
- ▼ assists with module modification
- ▼ monitors trainees’ progress

links to avoid misunderstandings is a constant task for the TATS facilitator. Although not a job expert, the facilitator contributes expertise in guiding the team through the task analysis and the eight implementation steps.

Working elements of the process model include conducting needs analyses; outlining targeted job(s); writing and verifying training modules; establishing an approval system; sequencing training for individualized training; implementing, debugging, and evaluating training modules; and developing a maintenance and audit plan.

The system, when fully operational, enables companies to

- ▼ establish written, agreed-upon performance standards that are measurable and observable
- ▼ train employees and verify that they are working to established standards
- ▼ evaluate employees regularly to ensure sustained performance; initiate appropriate corrective action if necessary
- ▼ provide a plan to continue using the system with an internal facilitator
- ▼ build teams, improve communication and decision-making skills, and boost morale.

Applying TATS

This training system can be used to introduce new operations or to train workers on those already in existence. Likewise, the system can exist alone as a new training program or can be integrated easily into an existing program, including classroom training.

In addition, the TATS can be applied effectively in areas of high turnover, in any situation that requires workers to be retrained, or to enhance current skills and knowledge. A primary advantage of having a structured, comprehensive on-the-job training program is that workers are trained very quickly in new skills with minimum disruption of the day-to-day schedule.

Another characteristic that makes the TATS so successful is the fact that it addresses many local features of the work environment that affect task completion.

The modules are short, step-by-step procedures required to perform specific tasks.

Criteria used in selecting employees to serve on the design team are

- ▼ credibility with their peers, supervisors, and staff
- ▼ willingness and ability to communicate their beliefs
- ▼ expertise on the jobs being analyzed
- ▼ willingness to go along with the group even when not in total agreement.

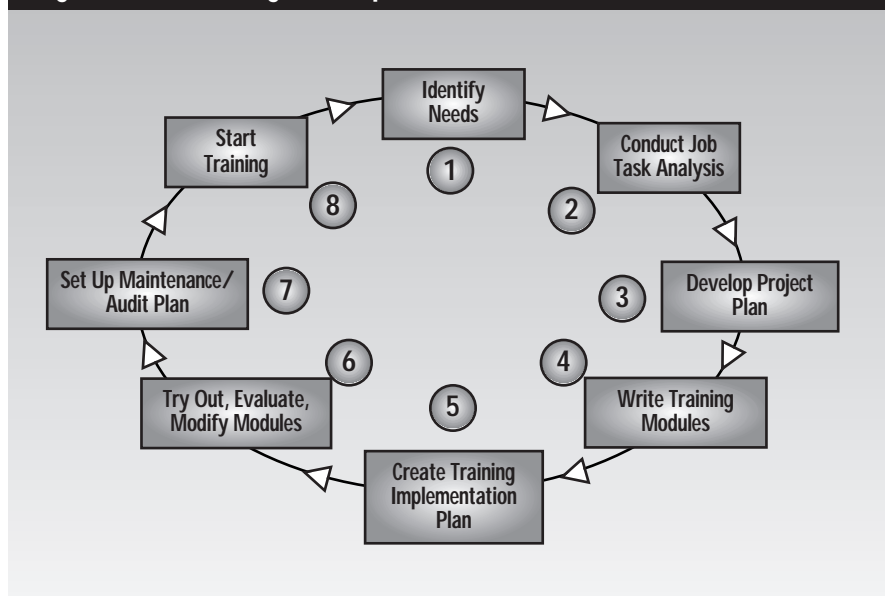
Many design teams at Boeing have included trainees and less experienced workers, with quite amazing results. Having nonexperts on the team helps to ensure the appropriate level of detail in the modules and fosters employee buy-in. Some design teams have invited vendors, techni-

cal writers, engineers, and other support personnel to join them from time to time. The teams decide on the best approach for proceeding and enlist the help of anyone necessary to help with their task.

The approval team is made up of knowledgeable workers, key supervisors, and technical experts. They review and approve all training modules for accuracy, completeness, and compatibility with current procedures and policies. In addition, they determine the administrative requirements for implementing changes.

The facilitator functions as a process expert and is present at all design team meetings to keep the team on track, help handle disagreements, and coordinate activities. Strengthening communication

Figure 1: TATS Eight-Step Process



For example, it can accommodate frequent personnel shifts or shift changes and help to resolve such organizational conflicts as incompatibility of procedures and terminology among departments or units through its standardization requirements. It also addresses such physical aspects of the workplace as inadequate space, inaccessibility, and environmental and safety conditions.

The design team may apply the system to critical elements alone or to the entire job. The team has ownership of the system and directs its development to answer training needs.

Implementation of the system is an ongoing process. Modules are written and used as needs arise. The flexibility of the modules—short, step-by-step, “how-to” procedures—allows for tailoring training to meet individual needs.

Eight-Step TATS Process Model

Figure 1 (opposite) shows the eight-step process for installing TATS in a work area. Following is a description of what occurs during each step.

Step 1: Need identification. Identification of the problem as a training concern is the first step. If workers are able to do the job but are prevented from doing it because of organizational constraints, there is not a training problem. The decision to conduct OJT must be linked to a

teams must be established and the roles and responsibilities of key personnel must be set up. (See Table 1 on page 24.) Once the teams are up and running, a member of the team—someone with facilitation skills—takes over as facilitator and relieves the training department of that task.

Based on the needs identified, the design team then defines the measurable objectives of the program. These may include overall performance and training goals, as well as specific performance standards associated with particular tasks.

Step 2: Job task analysis. The design team conducts the task analysis, which

ial for ease of instruction and learning. They allow for flexibility in situations where operating conditions require short periods of training and may be modified easily as specifications change. In addition, they give trainees a sense of accomplishment as they build a solid skill base.

Answers to the first question are written on wall charts by the design team facilitator. The second question breaks down the major tasks into smaller segments. Repeated use of the two questions ends when the team agrees that the branch of the “tree” takes no more than one-half hour to teach and learn. The flow chart in Figure 2 on page 26 illustrates the task analysis process.

Design teams may choose to address only critical elements of the job or the entire job from start to finish. The job breakdown is reviewed, modified, and accepted by area supervision.

Step 3: Project plan. After the job breakdown is complete, the team designs a plan to keep the rest of the project on schedule. Identified tasks are ranked according to frequency, criticality, difficulty, safety concerns, etc. Some modules may need to be completed first in order to begin training on those tasks right away. A benefit of putting the project plan together as a group is the assurance of employee buy-in or ownership. People

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documented business issue caused by lack of employee knowledge, skill, or attitude.

Once the need is established and a job is identified, the facilitator (normally a person from the training department) discusses the training system process with the workforce. Together with the facilitator, the employees evaluate the usefulness of the system in that area. The facilitator then gains their commitment to continue.

During this initial phase, the design

consists of breaking the job into small segments or tasks after answering the following questions:

- ▼ What do trainees need to know and be able to do to perform the specified job or task?
- ▼ Can that information be taught and learned by someone in one-half hour?

One-half hour segments are preferred because they fit the average attention span and provide manageable blocks of mater-

tend to support their own ideas. Upon completion of the plan, the team obtains supervisory approval. This helps strengthen management's involvement and commitment, too.

The project plan is critical. Programs can fail because critical elements of the process are not identified and implemented. A clear, concise activity plan averts disaster before it strikes. Depending on the program objectives defined, the project plan may include systematic data collection in order to track specific performance and training goals.

Step 4: Write the training modules. Initially, two or three modules are selected in order for the team to learn the writing format. The level of complexity written into a module is critical. Too little detail means the module is unusable because of insufficient information. Too much detail results in a standard operating procedure that is cumbersome and difficult to modify. Generally, writers include enough material to serve as 'memory joggers' for a trainer who's experienced at doing the job. Having a trainee or less experienced person on the design team proves invaluable

do the job. The team makes decisions by consensus rather than by majority vote so that all sides of an issue receive representation. During the writing phase, the team engages in varying activities: meeting other teams in different areas, discussing forms and formats, providing periodic reviews to management, and verifying modules on site.

Design teams typically meet for one or two hours per week in order to avoid interfering with normal job accomplishment. Often, design teams in other locations or on other shifts share in the module writing activities in order to lessen the workload for any one team. This process strengthens communication between teams and helps ensure buy-in once the modules are completed.

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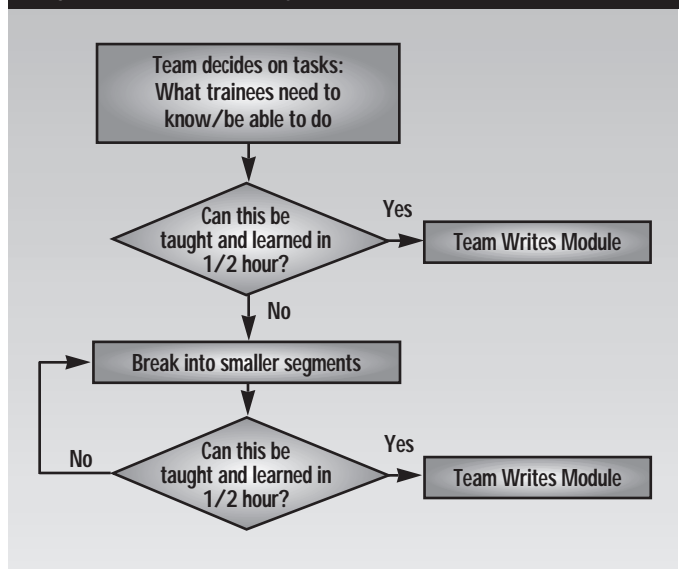
at this stage. Why? The less experienced person often provides the insight needed to make the modules most useful for training purposes.

Each module has a cover sheet with a performance objective, trainer preparation, special requirements, prerequisite modules, and the three-step job instruction training procedure. The authors of the modules (design team members) are listed at the bottom of the cover sheet, further assuring ownership.

When there is more than one way to do a task, the facilitator encourages the team to select the best way for a new trainee to

A major benefit of having teams of workers write the training material is that it provides a very nonthreatening way for experienced workers to admit that they are not sure how to do a task or that they learned the task incorrectly. It's also an excellent process for finding out where the knowledge and skill weaknesses exist. Some teams occasionally find it necessary to call in technical experts to answer questions about task accomplishment. Not only do companies end up with a structured on-the-job training program, but they increase the knowledge and skill base of their workers.

Figure 2: Task Analysis Process



Step 5: Training implementation plan. Near the completion of module writing, the team (with supervision) prepares a preliminary implementation plan. In addition, it conducts workforce evaluations to determine who needs training in which modules and by what dates, who will do the training, and how results of training will be measured. A person is assigned to prepare individual plans that consider prior skills and knowledge brought to the job by trainees, as well as a logical sequence for presenting the modules. Proper sequencing and spacing of training modules improves retention.

The selection and preparation of trainers also takes place at this stage. In addition to meeting the standard criteria for trainers, the TATS trainer must have hands-on experience with the modules. Preferably the trainer has served on the design team and participated in the on-site verification of modules.

Step 6: Try out, evaluate, and modify. Each module is verified on site at least twice: first by a trainee with a trainer and then by at least one member of the approval team. Modules should be verified using the same three-step job instruction training procedure used during actual training. This can serve as on-the-job training for the TATS trainers.

TATS encourages any additions, deletions, or corrections. Anyone may suggest

changes, including the trainees. This is also the time to make sure that the performance standards are adequate and that both trainers and trainees share a clear understanding of what counts as successful task completion.

Step 7: Set up maintenance plan and audit. Teams distribute manuals in work centers for use as resource guides. Everyone from line managers to operating staff has some ownership of the system. Throughout the design of the training program, the goal is to make the TATS model “the way we train around here.”

To keep the manuals up to date, each manual includes copies of change sheets. Change sheets are simple forms for identifying modules and the changes required. One member of the workforce is assigned to serve as an administrative coordinator to handle the records, forms, manual updates, etc.

The facilitator schedules annual audits to assess the status of TATS in the particular work area. The audit is a checklist evaluation of critical areas of the process. During this evaluation, the facilitator looks for signs of program obsolescence, identification of new training needs, opportunities to streamline the process to make it more cost-effective, and organizational changes that impact training.

Step 8: Start training. TATS incorporates traditional job instruction training techniques using a three-step training procedure. First, the trainer demonstrates the skill to the trainee. Next, the trainer coaches the trainee through the elements of the task while the trainee performs them. Third, the trainee does the task without coaching. Both trainer and trainee discuss the results afterwards.

Trainees are encouraged to practice the new skills until they feel comfortable with them. A general rule of thumb is to allow trainees one hour of practice for every one-half hour of training. An advantage of the typical two-column format used for the written modules is that the actual time spent by the trainer is minimized. Generally, once through the module using the three-step job instruction procedure is

sufficient. The trainee then can take the module and practice until competent.

At the conclusion of training, evaluation questionnaires are given to both trainees and trainers. The questions are open-ended to solicit as much spontaneous information about the training content and implementation as possible. Some teams also have developed attitude surveys to gauge the opinions from users of the system. The facilitator compiles evaluation data, keeping data confidential, and together with the design team and supervisor, plans any system modifications.

Putting It All Together

The eight steps in the process do not necessarily occur sequentially. There is normally considerable overlap. Teams usually work on the project plan, training implementation plan, maintenance/audit plan, and verify modules on site while the module writing phase is going on. In fact, it is convenient to think of the overall model as consisting of two processes: the module development process and the planning and maintenance process.

The module development process comprises Step 2, Step 4, Step 6, and Step 8. The planning and maintenance process consists of Steps 1, 3, 5, and 7. Checklists are used by the teams in developing and implementing the project plan, the training implementation plan, and the maintenance/audit plan.

By the nature of its design, TATS is an ongoing process. Once workers see the potential of the system, there is literally no end to the number of tasks they decide to work on. They get involved not only with the tasks themselves and the subsequent training, but begin to identify other issues that interfere with work performance and to arrive at solutions. ■

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