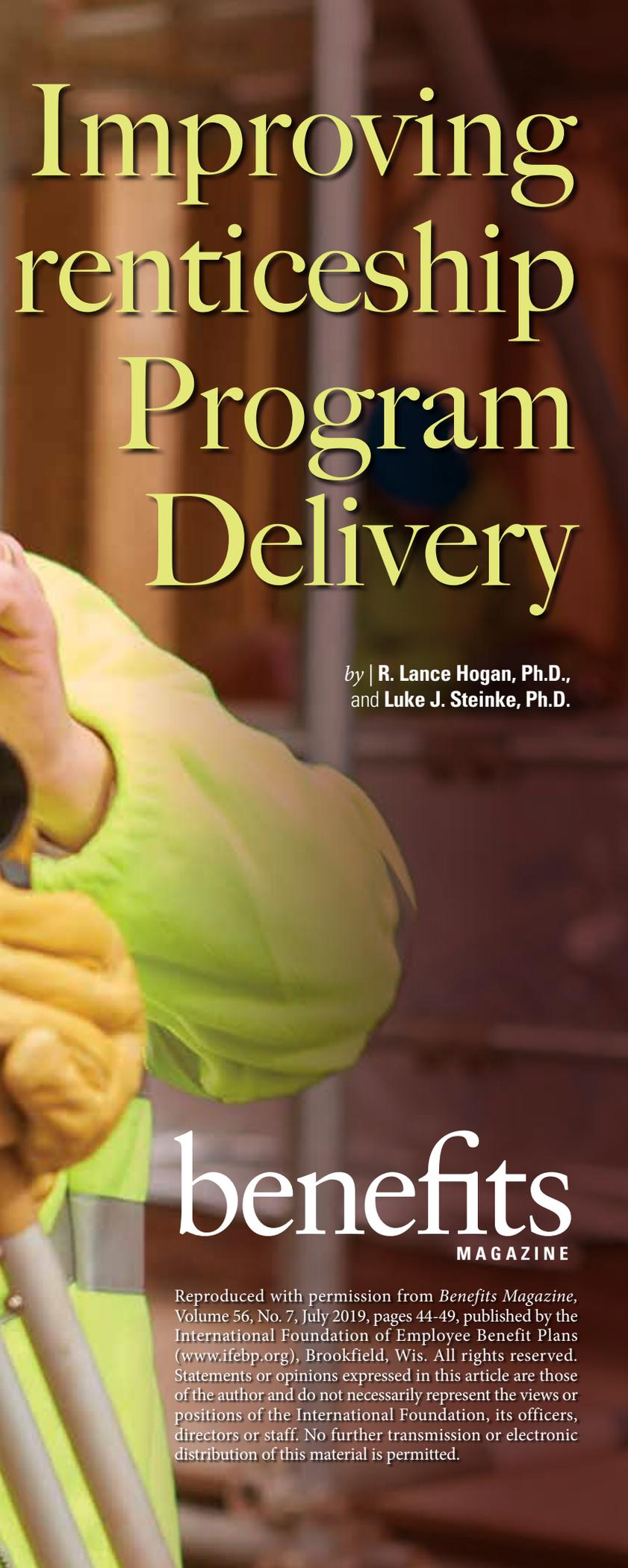


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# Improving Apprenticeship Program Delivery

by | **R. Lance Hogan, Ph.D.**,  
and **Luke J. Steinke, Ph.D.**

## benefits

MAGAZINE

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Research suggests that apprenticeship programs can better prepare apprentices for work by using a curriculum development model that focuses on teaching necessary skills, properly sequencing training and measuring performance. The authors say benefits include individualized training and a system that evaluates behaviors and skills based on actual work environments.

According to the U.S. Department of Labor, apprenticeship program participation has grown significantly in recent years, increasing from fewer than 50,000 graduates in 2014 to more than 70,000 apprentices graduating in 2018.<sup>1</sup> Most registered apprenticeship programs share the common goal of providing the highest level of training so that apprentices can succeed on the job, but many programs struggle to achieve optimal results. Challenges range from low completion levels (50-60% average<sup>2,3</sup>) to trainees failing to transfer learning to the job (less than 30% of skills transferring<sup>4</sup>). The obvious question many joint apprenticeship training committees (JATCs), training directors and trustees ask is “How can we better produce apprentices who meet and exceed expectations?”

### Traditional Apprenticeship Program Concerns

Many factors cause apprenticeship programs to underperform, but program directors most commonly identify variables within the programs themselves to be the most challenging. One commonly discussed concern is that programs tend to focus more on knowledge than skills. While skills are addressed within the program, a knowledge-heavy focus that mirrors a traditional K-12 approach has crept into instruction. Apprenticeship program directors, instructors and JATC members recognize that

this approach isn't optimal when developing hands-on skills because it can lead to too much focus on written tests of knowledge or passage rates for those tests.

Program directors commonly ask for clear measures of performance that are both valid and reliable. They express desire for methods that reflect the skills as they are applied on the job and an approach to measure these skills within their apprenticeship program. Typically, they find that performance on knowledge-based tests isn't predictive of job performance. For example, someone who scored 98 on a 100-point comprehensive exam may not meet or exceed employers' expectations, even though he or she scored well on an assessment.

Program directors also question whether the timing of skills instruction is appropriate for the work that apprentices are performing at that time on the job. In other words, are acquired first-year skills being applied in the first year, or are some of those skills not being used until much later? There likely is a need to review a program's overall training sequence.

Finally, the average age of apprentices is currently close to 28,<sup>5</sup> and program directors are recognizing that apprenticeship programs need to be designed to meet the needs not only of employers but also of more seasoned learners. These apprentices with previous work experiences and increased life responsibilities don't always find success in a traditional learning environment. They often desire an environment that allows flexibility in learning, lets the apprentice exercise self-direction and acknowledges prior learning experiences. This unique combination adds more

pressure to those managing apprenticeship programs.

### Why Do These Concerns Exist?

#### *Lack of Training Analysis*

Many programs haven't adequately determined the content of their training. At times, this is because program operators perceive that conducting some form of training analysis up-front will take too long, or the effort to conduct such an analysis will be less than fruitful.

This perception comes from past experiences organizations have had conducting needs assessments such as learner analyses, surveys and questionnaires, and task analyses. These efforts can take significant time to complete and often reveal more data than is useful to the development of effective curricula. Therefore, in an effort to forgo what has historically been an inefficient exercise, training programs produce content based on perceived needs of employers, what has traditionally been taught and what learners are interested in knowing. Training programs also must meet content requirements prescribed by the federal or state governments.

The result is a training curriculum that is primarily knowledge-based and disconnected from the skills required on the job. It often leads to overtraining some skills while undertraining others and is unlikely to transfer into successful workplace performance. Successful training analysis methodologies need to properly identify what is expected of someone on the job. When curriculum designers know the performance expectations, instruction can be designed to focus on skill development.

#### *Sequencing of Training*

Training content is often taught out of sequence, typically because training designers perceive that learners require foundational skills early on or that more difficult skills need to be taught later into one's career. The reality, however, is that the overall difficulty or perceived importance of a skill is irrelevant when compared with when someone needs to perform that skill on the job.

For example, if first-year apprentices are trained on skills that are required only of third-year apprentices, it isn't reasonable to assume they will remember and apply that training when it is needed years later. Skills that are not used are lost, regardless of the quality of instructors or curriculum. Properly sequencing skills ensures that individuals are able to perform when expected, curriculum designers and instructors know where to start, and learners are not overloaded with too much too soon.<sup>6,7</sup>

#### *Lack of Measurement*

Apprenticeship programs lack measures for performance or behavior change. The measures most often developed to test learners' ability to apply their skills often are not closely related to the kind of performance required in the occupation, or they consist only of a small sample of skills.

Organizations need to conduct an analysis to clearly identify all skills and the minimum level required for someone to perform those skills on the job. Valid and reliable measurement can then be implemented.

It is important to point out that these concerns are not unique to apprenticeship programs or training within the trades in general. Most

occupational training programs struggle with knowledge-centered training and developing a curriculum that is directly connected to and transferable to performance on the job and that also adequately measures performance. The good news is that the fix to these concerns isn't as complex as many think.

### Using DACUM to Overcome Concerns

Develop a Curriculum (DACUM), created in 1968 by R. E. Adams, is a system used to develop occupational training derived through analysis, learning and evaluation guided by a one-page skill profile.<sup>8</sup> The DACUM system is widely accepted as an innovative approach for the development of curricula combined with an evaluation process for occupational training programs. The original DACUM system designed by Adams, however, is much different from what is often promoted as DACUM.<sup>9</sup>

The DACUM system, as designed by Adams, uses a group of expert workers within the occupation to conduct an analysis to determine necessary competencies and skills, properly sequence skills based on when they are needed and determine the minimum level of skill required for someone to perform successfully on the job.<sup>10</sup> All of this information is recorded within a competency-model chart referred to as a *DACUM chart*. This chart and its content are used to develop learning materials called *learning activity batteries* (LABs) and then serve as an evaluation instrument for the acquisition of skills using the DACUM rating scale. The system follows two clearly defined models: the Development Model for DACUM Learning Programs and the DACUM Learning-Evaluation Model.<sup>11</sup>

The success of the DACUM system was immediately evident with its first implementation in 1968 to prepare oil burner technicians in Yarmouth, Nova Scotia. Because the DACUM system was specifically designed to address the concerns that challenge occupational training programs, it continues to be successfully employed today. The following summarizes the aspects of DACUM that make it successful in overcoming traditional occupational training concerns.

#### **Analysis and Curriculum Development**

*Occupational analysis* is one of the primary phases of the DACUM system. This analysis identifies all required performance on the job and effectively communicates what is

### takeaways

- Many apprenticeship programs struggle with low completion rates and failure of apprentices to transfer learning to the job.
- Apprenticeship programs tend to be more focused on knowledge than skills, mirroring a K-12 educational approach. Common weaknesses include lack of training analysis, improper sequencing of training and failure to measure skill acquisition.
- Develop a Curriculum (DACUM) is a system for developing occupational training that uses a group of expert workers within an occupation to determine necessary competencies and skills, properly sequence the skills and determine the minimum level of skill required for someone to perform successfully on the job.
- DACUM also provides a clear guideline for effective performance assessment, verification of training content and the opportunity for individualized/personalized training.

expected of someone on the job (competencies and skills), when it is expected (sequencing) and at what level it is expected.<sup>12,13</sup>

This analysis not only addresses training program content but does so in a fast and efficient manner. On average, DACUM chart development typically takes three days. Further, this three-day activity effectively replaces the first three extensive development activities of a traditional training program: training needs assessment, establishment of learning objectives and curriculum organization.

A set of materials and other learning resources selected to facilitate each specific skill are developed as an individual LAB. The time it takes to develop training materials for each LAB is reduced since available materials are gathered and packaged. Although circumstances may vary and different degrees of assistance may be required for initiation of a learning activity, instructors and learners can select learning activities in the order that best suits their development and in the order of immediate performance needs.

By doing so, the DACUM system avoids structuring adult learning in ways that might be suggested by studies of learning conditions and resulting instructional models for children. This model provides enough flexibility to ensure that adult learners have an opportunity to learn in the way that best suits their individual characteristics and background. In addition, the planning and organization of the DACUM system are based entirely on individual learning. In this system, it is assumed that individual trainees can begin the program

at the same time or at different points and progress at their own rate depending on their own abilities and aptitudes.<sup>14-16</sup>

### **The DACUM Rating Scale**

The heart of the DACUM system—what makes it successful—is the seven-point *DACUM rating scale* in each DACUM chart. This descriptive scale categorizes occupational performance levels in order to measure observable behavior when evaluating trainee performance. Evaluators use the scale to measure each trainee’s performance, similar to how an employer or supervisor would evaluate an employee’s performance. It is applied equally well to each skill on the chart. Consequently, tests and evaluation procedures do not have to be developed.

The direct focus on observable behavior in defining the learning goal on the DACUM chart removes much of the pressure to make learning information-oriented. Each learning activity becomes a problem-solving situation in which the learner brings to bear whatever resources he or she can obtain in the form of information, instructional assistance or meaningful experiences.

Because of the approach to learning and the provision of a universal skill rating scale, evaluation also ceases to be information-oriented. The system is not geared to teach specific information; therefore, there is no need to evaluate the degree to which it has been absorbed by the trainee. The system is geared to the achievement of behavioral goals, and the evaluation focuses on the degree of success in achieving these goals.

Prescribed entry-level requirements (prerequisites) become relatively unimportant using the DACUM process. Setting entry-level requirements based on groups and group learning is unnecessary, because the emphasis is on individual learning. At the same time, the focus on achievement of skill objectives removes much of the need for bringing an extensive educational background to the training program. There is, for example, less need to be an expert at reading learning materials. As long as individuals can read at a level normally required for performance in the occupation itself, the DACUM system can accommodate them.

One of the features of the DACUM system is that it has an evaluation system that not only measures behavior changes but does so in the way it would be measured in a work environment. In fact, it is as suitable for evaluation in the work environment as for evaluation during training. It has enough intervals to make it a useful tool for distinguishing between levels of ability as they are observed in and by the learner.

### **Conclusion**

The DACUM system has proved successful in determining what trainees must do to be successful on the job, because a DACUM chart is based strictly on the competence and skills performed on the job.<sup>17</sup> It provides a clear guideline for effective performance assessment, verification of training content and the opportunity for individualized/personalized training. When produced using sound principles of occupational analysis, and by following the systematic procedures outlined in the DACUM learning models, the system proves to be valid and useful for occupational performance.<sup>18-20</sup> 

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### **Endnotes**

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**R. Lance Hogan, Ph.D.**, is a professor at the Eastern Illinois University Lumpkin College of Business and Technology, teaching in the areas of human resource development, organizational development and quality management. He holds a Ph.D. degree in workforce education and development from Southern Illinois University–Carbondale, an M.B.A. and B.S. degree from Southeast Missouri State University. Hogan also has numerous certificates in human resource improvement, curriculum development and production process troubleshooting.



**Luke J. Steinke, Ph.D.**, is a professor in the organizational development department at the Eastern Illinois University Lumpkin College of Business and Technology. He has more than 15 years of experience as an educator, trainer and consultant and is well-known for his teaching and leadership in curriculum design. Steinke has published two books focusing on occupational training—*DACUM: The Seminal Book* and *DACUM: The Coordinator’s Guide to Occupational Analysis* with DACUM creator Robert E. Adams. He holds a Ph.D. degree in workforce education and development from Southern Illinois University–Carbondale, an M.S. and B.S. degree from Northern Michigan University and an associate’s degree from Moraine Park Technical College.

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A more complete description of the DACUM system is available in *DACUM: The Seminal Book*; *DACUM: A History of Develop a Curriculum*; and *DACUM: The Coordinator’s Guide to Occupational Analysis*.

