The authors believe a relatively small adjustment in how instructors teach technical skills to apprentices might help apprentices reach proficiency more quickly and efficiently.
Redefining Instruction in Apprenticeship Training

by Mark L. Johnson, Ed.D., and Jeanie M. Lambeth, Ed.D.
When apprentices are being taught a skill, instructors should be sure the students have mastered each step of the task before the next step is taught, researchers believe. This shortens the delay between students receiving instruction and being expected to perform a task successfully, leading to more successful outcomes in apprenticeship training.

Working with the International Alliance of Theatrical Stage Employees (IATSE) Training Trust Fund, the authors used a modified version of the ADDIE educational model first used by the U.S. armed forces in the 1970s at Florida State University. The separate parts of the model are:

- Analysis
- Design
- Development
- Implementation
- Evaluation.

Results of their research may have wider implications in career and technical workforce development and apprenticeship training.

All U.S. armed forces branches later adapted and used the ADDIE model, and it frequently has been used and modified as a best practice for curriculum development and instruction in the private sector. The biggest attraction to this model is its flexibility for use in both individual and traditional group instruction.

This article focuses on the implementation phase of the ADDIE model. The authors believe that a change or shift in how technical skills are taught can shorten or eliminate an effect described as educational latency, which occurs when a time delay between the demonstration and practice of a skill hampers retention.

A Shift in the Way Instruction Happens

The accepted standard for teaching includes the teacher demonstrating the skill while the students observe. Then students demonstrate the skill while the teacher observes them. The teacher then provides feedback and revisions as needed. The expectation is that the students will successfully perform the skill after the demonstration. The amount of time that may have passed before students demonstrate the skill could be minutes, hours, days or even weeks after receiving instruction. This period of time is when educational latency occurs.

The challenge here is for the students to remember what was demonstrated, in perfect detail, and perform it proficiently. This is the normal expectation by instructors, who become frustrated when students cannot perform the task or skill or instructors need to reteach the skill because several of the students didn't seem to "get it" the first time it was demonstrated.

The authors propose a twist on the demonstration process within instruction of technical skills—to change when students are expected to perform the task. Rather than teaching an entire skill all at once, an instructor would teach a single step of the task being taught. The students would then demonstrate that same step while the instructor checks for understanding and corrects mistakes as needed. Once each student has completed the step successfully, the instructor would teach the next step of the task and repeat the process for each step. The authors understand that this concept poses several challenges for instructors and requires a total shift in how teaching happens.

An example of this would be a carpenter teaching students to cut a 2 x 4 to a specific length. Instead of showing the students the whole process and then having the students do it, the instructor would first show them how to measure the board. Then each student would measure a board. When the instructor saw that each had measured correctly and pro-

The ADDIE Model

The separate parts of the ADDIE model are:

- **Analysis**: In the first phase, the challenge of the course is detailed and objectives or learning targets are established. The learner skill level is identified.

- **Design**: The second phase addresses the issues of learning objectives/learning targets, content, assessment instruments, student exercises, subject matter analysis, lesson planning and media selection so that the training reaches an optimal outcome. The training will follow an orderly, logical process toward completion of the course or curriculum.

- **Development**: The content and any of the media needed are created for instruction. All student learning activities and practice exercises are developed.

- **Implementation**: The course or training is implemented according to the curriculum that has been designed. Teachers and trainers are challenged to implement the activities and introduce the content necessary for a student to gain the skill at a level of proficiency that has been predetermined by the industry or the accrediting body.

- **Evaluation**: Throughout the ADDIE model, evaluation takes place after each phase of the process and through a final evaluation.
vided the necessary feedback, he or she would show students 
how to mark the board, then have them mark it and so on 
until they have successfully completed all of the steps needed 
to cut the board accurately.

Evidence from a recent study conducted at an IATSE 
training center in Las Vegas, Nevada demonstrates this con-
cept and the shift in “how” instruction happens.

The data in the table show a comparison of two differ-
ent methods for teaching an introductory electrical class to 
IATSE employees, teaching them skills such as wiring a ba-
sic circuit. In both cases, the content and the instructor were 
the same, as were the pre- and posttests for each site. At Test 
Site 1, the instructor used the traditional four-step technical 
training method:

1. He introduced the skill to students.
2. He demonstrated the skill for students.
3. The students then demonstrated the skill for the in-
structor.
4. The instructor assessed their performance. As the re-

sults shown in the table indicate, while all 12 students 

improved their scores, only eight of the 12 got a 100% 
on the posttest.

At Test Site 2, the instructor made an adjustment in teach-
ing by combining teaching steps 2 and 3. In this scenario, the 
teacher taught a single step and had the students perform 
that step while he modeled the performance. He immediate-
ly checked their performance and provided feedback when 
a correction needed to be made. Once everyone was on the 
same page, the instructor moved to the next step and con-
inued until the entire skill was completed. When the students 
of this group took the posttest, all 13 students got 100%.

**Conclusions, Implications and Recommendations**

Apprenticeship trainers will be more efficient and effective 
by shifting their teaching methods to the modified version of 
the instructional process. This also will provide the best op-
opportunity for students to learn the skills necessary to be suc-

cessful in their trade in the most efficient manner possible.

The implications of educational latency in training and 
instruction for the IATSE Training Trust Fund Train the 
Trainer Program could be important when thinking about 
how much time has been spent in reteach mode during in-
struction time. Rather than spending time reteaching the 
lesson, instructors could be teaching advanced skills much 
sooner.

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**TABLE**

Results From Las Vegas IATSE Pretest/Posttest Experiment 2015-2016

<table>
<thead>
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<th>Test Site 2</th>
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International Foundation. 2014.

This research could also have important considerations for the concept of perfect practice. By following the proposed instructional shift in teaching technical skills, instructors can guarantee that all students have practiced the skill successfully the first time they attempted to demonstrate the task or skill. All further practice would be based on what they performed correctly the first time. For the apprentice, this means mastering skills faster, which will help them be more productive and move forward in the certification process for their trade. For the instructor, it means shifting the timing of student demonstration and providing feedback to correct mistakes sooner rather than having the students wait to perform the task until the instructor has completed the entire process, possibly saving materials and equipment as well as—most importantly—time.

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