

ADDIE: A systematic methodology for instructional design that includes five phases:
Analysis, Design, Development, Implementation, and Evaluation.

I first was exposed to the ADDIE model in April 1983 at the Holiday Inn Bar in New London, Connecticut. I had just received my orders to leave my role as a management instructor at the Coast Guard Academy and become the director of training for the Coast Guard's west coast training center. My future commanding officer, Captain Dick Marcott, was visiting the Coast Guard Academy in his role as the director of training and education for the Coast Guard.

After explaining to me the basics of the ADDIE Model, he told me to call one of his assistants and get a set of orders to spend one day at the Coast Guard training center on Governors Island, New York, one day at the Coast Guard training center in Yorktown, Virginia, and two days with Charlie Swaringen. I asked him, "What's a Charlie Swaringen?" And all he responded with was, "You'll find out."

As it turned out, Charlie was the civilian education specialist at the Coast Guard aviation training center in Elizabeth City, North Carolina. He had brought the ADDIE Model to that training center from his role as an educational specialist for the U.S. Army and had revamped the way in which training was developed. I would not only steal many of his ideas but eventually many of his course designers to teach at an instructional training school that I had expanded at my west coast training center. It was from there that we exported Charlie's ideas and method throughout the Coast Guard. This turned out to be one of the first steps towards the Coast Guard's extended love affair with improving workplace performance.

Over the past ten years I have been privileged to work with a number of organizations as they moved from training to broader performance improvement solutions. Some were drawn to performance improvement as they sought greater transference of what was learned in the classroom to actual application on the job. Others were forced to make the move as their organization focused more on results and their training departments had to demonstrate that they contributed to the bottom line. If a training department is seen as a cost center, that is, part of the overhead of doing business, it is vulnerable to reductions and outsourcing during lean times.

Further aggravating this situation is the fact that many managers are addicted to training, which remains their "drug of choice" for all performance problems. For these managers, training has been highly addictive with a need for more and more of this very expensive and temporary fix that focuses on a symptom rather than the underlying causes. By asking for training solutions, managers hope to pass the performance issue to the training department. But the training department does not control the environment the student came from and will return to. The training provided may have little impact if managers do not perceive the need to change the work environment to reinforce the training provided.

Regardless of the cause, training departments must earn the right to move from being training order-takers and providers to actually improve individual and organizational performance using human performance technology (HPT). The starting point for this transition is by providing quality training that produces measurable results of value to the organizations they serve.

To earn the right to truly focus on improving workplace performance, training departments must build a reputation for conducting rigorous analysis followed by improved design, development, and implementation of training solutions that produce measurable results. Only then will their organizations be ready to allow them to expand their role.

Most instructional design begins with an assumption that training will improve performance. If I could add one more principle to the Standards of Performance Technology (ISPI, 2010) it would be that performance improvement practitioners are "solution neutral", in that they do not enter the assessment stage with a pre-conceived idea of the solution. While the other principles are important as they encourage focusing on results, thinking systemically, adding value, and partnering, they but do not address this necessary mindset of beginning an assessment without having a solution, such as training, in mind.

DILUTION OF THE ADDIE MODEL

Many organizations claim to use the ADDIE model for their instructional design to provide the necessary structure for a systematic approach to Analyze, Design, Develop, Implement, and Evaluate training. But for far too many training departments, ADDIE has been diluted over time to the point where their instructional design is best described as "addie". When I had one of the best instructional designers I know, Jeanne Strayer CPT, review a draft of this article, she commented that ADDIE may have "stilled" in many organizations rather than diluted over time.

Some characteristics of "addie" include:

1. analysis is limited to a needs assessment that assumes that training is the right and only solution with no investigation of the underlying performance gap and its causes; the work environment and its impact on transference of the new knowledge and skills to the workplace is also not taken into account; "A" became "a" as the broader assessment techniques used in performance improvement were developed while many instructional designers remained as "order takers" by developing training without taking into account the work environment.
2. design documents either do not exist or fail to clearly identify the target audience as well as specific behavioral objectives, conditions, and means to measure the results (Mager, 1984); if a design document exists at all, it is written with knowledge objectives that describe what a student must know rather than do; "D" became "d" as fewer organizations saw the value in developing design documents that identified behavioral outcomes, conditions, and criteria to measure success.
3. develop training materials and courses that may have little impact on individual and organizational performance since the training is built on the shaky foundation caused by poor analysis and design as well as not taking into account the work environment from which the student comes and returns; "D" became "d" by focusing on training as the only solution without taking into account the work environment.
4. implement training as the sole intervention; "I" became "i" as little attention was paid to the work environment and its impact on transference of knowledge and skills from the classroom to the workplace.
5. evaluate participant reaction and acquisition of knowledge while avoiding the issue of training effectiveness by measuring individual performance on the job and/or impact on desired business outcomes; "E" became "e" as very few courses are evaluated to see if the students did what they were trained to do when they returned to the job and whether those changes in behavior led to improvement of a desired business outcome; the good news is that training order takers will never know whether their courses had an impact on individual and organizational performance.

Using ADDIE for a New Course

The systematic application of the ADDIE model will align the training function with other efforts to improve workplace performance. This can be the first step for a training department to move toward greater use of the broader solutions needed to improve workplace performance.

Analysis

Rather than accepting training as the only solution and starting the process with a needs assessment, analysis should be expanded to include identification of a performance gap that defines in measurable terms the present and desired levels of performance (Chevalier, 2010). By clearly describing the present level of performance, a performance baseline is established before the training is done. Measurement of this baseline can include measures for:

1. task accomplishment such as productivity, quality, cost, waste, and time;
2. intermediate outcomes such as customer service; retention, and referrals, and sales;
and
3. desired business outcomes such as profitability and market share.

Setting a reasonable goal that serves as a short term milestone in closing the performance gap can also be helpful in motivating those who will do the work. Trends in performance can also be established by identifying relevant business metrics that are already in use. Existing business metrics are usually inexpensive to use in evaluation since they are already being collected, analyzed, and reported (Chevalier, 2010).

Following the gap analysis, a needs assessment should be done to identify the knowledge, skills, and attitudes necessary for the target population to close the performance gap. The employees' capacity to learn and to do the desired behavior as well their motives for doing the task should also be assessed.

A question that can also be asked to expand the scope of the needs assessment is, "What can be done to improve transference of training back to the workplace?" This opens the door to examining the work environment to identify if the employees have the necessary information (clear expectations, feedback, and coaching), resources (time, material, equipment, and clearly defined processes and procedures), and incentives (measurement of performance and rewards) to reinforce the training received. Sound familiar? It should as these are the environmental factors in Gilbert's Behavior Engineering Model (Gilbert, 1978 and Chevalier, 2003).

Even if training is the pre-conceived solution, defining the performance gap will provide the metrics needed to determine the effectiveness of the training while a focus on transference will allow for identification of work environment factors that need to be addressed.

Design

Many organizations do not take the time to produce design documents (moving directly from needs assessment to training development) or have limited their design documents to identification of knowledge based outcomes, that is, what the student will know.

The solution to this is to develop an outcome-based design document that identifies prerequisite knowledge and skills as well as clearly stated behavioral objectives, conditions, and criteria to measure the results. A detailed content outline as well the choice of instructional strategies, learning activities, methods, and media should also be described.

Develop

The development phase includes identifying pre- and post-training work, producing instructor and participant manuals, identifying training support materials and media. The training materials are further refined by piloting, evaluating, and refining the course. Most courses should initially be piloted with the target audience and subject matter experts when they are about an 80% level of development. Participant feedback during the pilot program is important to developing the finished product.

Training development is the strength of most training departments but very often falls short because of failures in the analysis and design stages. Further, failure to evaluate the training by measuring on-the-job performance and impact on a desired business outcome limits the development process. Many organizations end the development process with the pilot programs without measuring the student's performance in the field. Training development should be an ongoing process of systematic assessment and continuous improvement.

Implementation

Implementation for the typical training department is limited to delivering the training to the target audience. But for the training to be effective, it must be supported by the work environment to which the student returns. Regardless of how good the course, students will usually conform to the expectations of their supervisor or work group when they return to their jobs. Further, students need to have the right resources (such as time, materials and equipment to apply what they learned. The work environment should also measure and reward the desired behaviors if they are to be transferred from the training to the job.

Evaluation

Perhaps the greatest failure of the ADDIE model is that of not systematically evaluating the impact of training to determine whether the student is applying what was learned and if that change in behavior is having a positive impact on a desired business outcome. Most training departments will limit evaluation to a survey to measure student reaction and possibly an end-of-course test to measure what was learned.

Some guidelines for training evaluation refined from an earlier article (Chevalier, 2003) are:

1. Evaluation should use existing measurement systems where possible. Since they already exist, there is baseline information available, trends can be seen, management believes the metrics measure a desired business outcome, and it is cheaper than setting up a new evaluation system.
2. Surveys and tests can lead to a false sense of security; there may be no relationship between how participants feel about the training or how they perform on a test and improved individual and organizational performance.
3. Post training surveys of students and their supervisors can measure application of what was learned on the job and can be used to refine the training.
4. Measurement of the progress in closing the performance gap is the best indication of the value of the training.
5. It may be not desirable, practical, or even necessary to do all levels of evaluation. Select the levels that will produce the information needed to evaluate the intervention.
6. Use multiple measures so that performance is not driven by just one desired outcome. Trade-offs are often seen between measures for quality, quantity, time and cost. For

example, if a goal is stated in terms of increased quality alone, decreases in quality and increases in time and cost may occur.

7. The act of measuring encourages the use of what was learned. Evaluation can improve transference of what was learned in training back to the workplace.
8. Evaluation documents the impact that training has made and makes the training function more defensible during budget cuts and more credible when asking for more resources.
9. You haven't earned the right to revise a course until you've systematically evaluated it.

The real scary part of this is that my best estimate is that only about 2% of training is evaluated to determine its impact on a desired business outcome. In the United States alone, where over \$100,000,000,000 is spent on training and development each year (Patel, 2010), there has been little attempt to determine training's impact on desired business outcomes.

The worst instructional design takes place when a training department becomes mere order takers. For example, a senior manager comes into the training department and says, "I need a course on time management for my people; they just don't manage their time well." For the training order takers, this statement constitutes a needs assessment. From there they substitute selection for design and development by searching the web for an on-line course on time management. Implementation is done by announcing the availability of the new course and no evaluation is ever done to see if anyone takes the course and whether it had a positive impact on their ability to manage their time.

A comparison of the present and desired states of instructional design for many organizations is shown in Figure 1.

	addie		ADDIE
a	1. Training is assumed to be the only solution. 2. Needs assessment is done to assess knowledge, skills, and attitudes shortfalls.	A	1. Analysis is done while remaining solution indifferent. 2. Performance assessment done to identify performance gaps and underlying causes.
d	1. Design, if done at all, is limited to training solutions. 2. If done, desired knowledge described as the outcome of the training.	D	1. Done for all high-value courses. 2. Identifies target audience, pre-requisite knowledge and skills as well as clearly stated behavioral objectives, conditions, and criteria to measure the results.
d	1. Training is developed and refined. 2. Other causes and solutions are not addressed.	D	1. Multiple solutions, including training, are developed and refined. 2. Work environment issues are addressed.
i	1. Implementation limited to "stand-alone" training. 2. Transference is limited since the work environment was not taken into account.	I	1. Multiple interventions are addressed that focus on the work environment as well as the individual. 2. Transference is enhanced by changing the work environment to support the training.
e	1. Levels 1 (reaction) and 2 (learning) are	E	1. Appropriate Levels are evaluated.

<p>evaluated. 2, Levels 3 (behavior change) and 4 (impact on a desired business outcome) are seldom, if ever, addressed.</p>	<p>2. Success is measured by progress in closing the performance gap, that is, the difference between the present and desired levels of performance.</p>
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Figure 1. Present and Desired States of Instructional Design.

USING ADDIE WITH EXISTING COURSES

The starting point for the use of the ADDIE model for exiting courses is to review and/or develop the design document. If it already exists, the objectives should be reviewed to see if the objectives are written as behavioral outcomes, have conditions under which the behavior is done, and have the criteria to measure success described. If no design document exists, it will have to be created from the instructor and participant manuals.

The next step is to evaluate the existing training by surveying graduates and their supervisors to determine how well the graduates perform the new behaviors on the job. This information will serve as a baseline to measure improvement as the training is revised based on the feedback received from the graduates and their supervisors. Another question to ask is what else did the graduate need on the job that wasn't covered in the training.

Where possible, existing business metrics that are related to the graduates' performance should also be identified and measured. Trends in performance should also be reconstructed making a more accurate measurement of performance possible.

With the feedback from graduates and their supervisors as well as the level of performance established by existing business metrics, the course can then be redesigned, developed and implemented followed by another round of evaluation. Systematic assessment and continuous improvement will yield courses that improve individual performance as well as desired business outcomes thus establishing value for the course.

Conclusions

The starting point for moving from training to improving workplace performance is adherence to the ADDIE model. By producing measurable results, training departments will earn the right to expand their scope to improve the work environment. Training departments that fail to demonstrate value, as measured as improvements in desired business outcomes, will be perceived as overhead and be subject to downsizing and outsourcing as organizations strive to become more efficient.

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