

ADDIE Model Revisited

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The purpose of this presentation is to emphasize that quality instruction does not happen by accident! There is actually a science to training – and that science is called instructional design. The best training happens when you use a planned systems approach.

The principles illustrated here can be very useful if you are a new trainer who is tasked with developing a training course for your laboratory. Or you might be asked to do some one-on-one training for a new employee or perhaps you are involved in a professional or community organization where classes are conducted. – the same principles apply.

Laboratory Training Mission Statement

- NLTN - Improving Laboratory Practice of Public Health Significance
- Your training mission statement

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Just a reminder to keep your overall goal in mind when you are planning training. Using the ADDIE principles will help you better reach that goal.

Training

- People new to the job
- About a new technology
- Bring people up to defined standards

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The purpose of training is to help workers use skills and technology efficiently and effectively to produce the outcome that managers want to see. Training can be for :

people new to the job

about a new technology or

to bring people up to defined standards

And training can be anything from a formal course to one-on-one instruction.

Let's talk a little about the value of good training to the employer.

Benefits of Good Training

- Higher competence
- Improved quality of service
- Increased motivation and retention
- Raised commitment
- Reduced absenteeism

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The Institute for Employment Studies in the UK asserts that helping employees to update existing skills and gain new skills will help them sustain productive and satisfying employment. Benefits of good training include:

higher competence; improved quality of service; increased motivation and retention; raised commitment; reduced absenteeism.

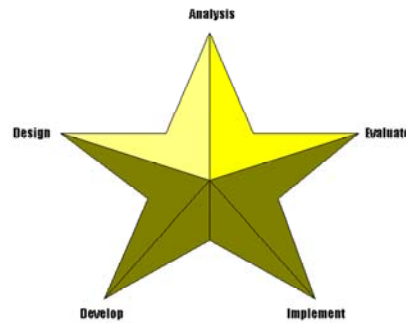
Many studies have shown that employers benefit from having their employees participate in quality training. And again, that training can be formal classes, informal bench training, self-study, etc. The key is that the training must be of a high quality and be created using sound instructional design principles.

Managers want good return on their investment of time and money. Poor training is a waste of time and money.

Good training is more likely to result from a systematic approach than from a haphazard approach to instructional design.

Instructional Design

- Analysis
- Design
- Development
- Implementation
- Evaluation



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There are a lot of models or blueprints that can be used to describe a systems approach to designing good instruction, but an easy one to remember is the ADDIE model.

ADDIE stands for Analysis Design Development Implementation and Evaluation.

There are 5 steps in this model of instructional design. Each step has an outcome that feeds a subsequent step.

During ANALYSIS, the designer develops a clear understanding of the gaps between the desired outcomes or behaviors, and the audience's existing knowledge and skills. The DESIGN phase outlines specific learning objectives, assessment instruments, exercises, and content that addresses the gap. The actual creation of learning materials is completed in the DEVELOPMENT phase. During IMPLEMENTATION, these materials are delivered or distributed to the student group. After delivery, the effectiveness of the training materials is EVALUATED.

ADDIE



**Analysis, Design, Development,
Implementation, Evaluation**

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This all sounds a little vague, so maybe it would help to compare creating a training program to baking a cake.

For example, if you wanted to bake a wedding cake, what would you do?

A (analysis) Talk to the bridal couple about - What kind of cake? What type of decorations? How many servings? How much do they want to spend?

D (design) Decide on the shape, the number of layers, what kind of filling, kind and color of the frosting, make my budget

D (development) Choose the recipe, select and purchase the ingredients, mix the batter, bake the cake, make the filling and the frosting

I (implementation) Assemble everything into a beautiful cake and deliver it to the bridal couple.

E (evaluation) the guests and bridal couple taste the cake – is it as good as it looks?

ADDIE

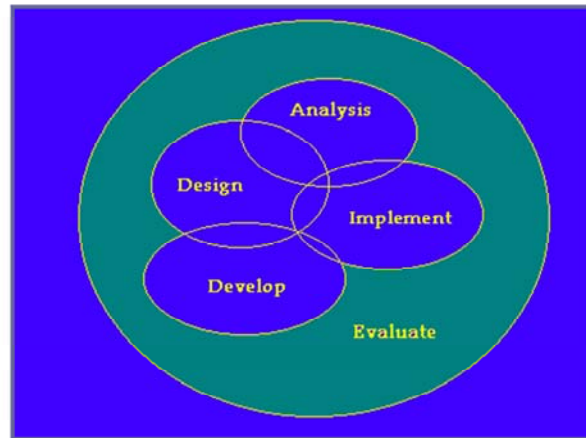


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But what if you work in a large bakery and you make dozens of wedding cakes every day. Then it is doubtful that you could do all these steps by yourself. You would need a team of people doing the work. Each person on the team would be responsible for one or more of the steps in creating the wedding cake.

That is the way you typically work in creating and delivering training programs. You are all performing steps in the ADDIE model, but rarely does any one of us perform all the steps by themselves. So it is sometimes difficult to see the whole, if what you are working on is only one piece of the model.

ADDIE



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Yes, the wedding cake idea is a good analogy. I can see the similarities.

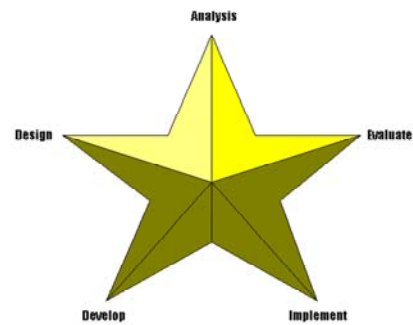
I'd like to point out it is important to evaluate as you go along not just at the end – That's why I like this diagram of the ADDIE model. It illustrates that the 5 steps are not necessarily sequential and that evaluation occurs throughout the process.

I suppose in the wedding cake analogy you would taste the cake batter, the filling, the frosting as you are making it – and before it gets assembled and presented to the wedding guests.

Perhaps each of our part in the systems approach to designing and delivering instruction will become clear if you go through the steps in a little more detail. Many of you are overly familiar with these steps, but you have some new people, and I think you can all benefit from a brief review.

Instructional Design

- Analysis
- Design
- Development
- Implementation
- Evaluation



Once again, you are going to talk about each of the steps in the instructional design process in more detail, compare it to making a wedding cake, and talk about where that step corresponds to our NLTN structure.

Analysis

- Examine the target audience
- Understand the job or task being taught
- Look for gaps in skills and knowledge
- Draft a budget
- Choose the instructional setting



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The first step is analysis. In the wedding cake analogy this is where you talk to the bridal couple about - What kind of cake do they want? How many servings? How much do they want to spend? And so on.

In the ADDIE instructional design model this is where you

Examine the target audience

Understand the job or task being taught

Look for gaps in skills and knowledge

Draft a budget

Choose the instructional setting

Target Audience

- Public health
- Environmental
- Clinical
- Physician office lab
- Phlebotomist
- Clinicians
- Others



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Your primary target audience is laboratorians, but there are lots of different kinds of laboratorians, and knowing as much as possible about the target audience prior to beginning to design the training is very important.

“It is the first question I ask when someone comes to me with a training need or idea.”

Core Competencies

“the skills, knowledge, and personal attributes that contribute to an individual’s success in a particular position.”

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Another part of analysis is to understand the job or task that is being taught. You want to determine and define the core competencies that the worker needs to have at the end of the training.

Core competencies can be defined as “the skills, knowledge, and personal attributes that contribute to an individual’s being successful on the job”.

The changing business environment is driving organizations to change and adapt, to improve and work smarter. Their customers' expectations are changing. Employees need, and desire, to be equipped with the skills they will use to handle new types of work and deal with change. Management needs to know what is expected of the staff that they supervise and what trends will affect their businesses. Defining core competencies is vital to the continuation and success of an organization.

Significant work has been done on defining competencies specifically for public health professionals. A summary can be found in the APHL’s member resource center. In designing a particular training class you look at competencies for a specific type of laboratory work. For example, you might look at what a laboratorian would need to know and be able to do to work effectively and safely in the TB section performing routine automated identification and susceptibility testing for various mycobacteria species. Knowing what competencies are needed for the job helps you decide what to include in the class.

Training Needs Assessments

- Focus groups
- Phone survey
- Paper survey
- Individual interviews
- Data which points to competency
- Keeping your eyes and ears open

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One of the tools you can use to help define the audience and identify gaps in competencies is a training needs assessment or TNA. A TNA can be a phone survey or a paper survey. You can interview individual workers. You can look at data that point to competency. Of course you must consider management directives and new regulations. Always keep your ears open and your mind tuned to training needs.

And here's a hint. Sometimes during this phase you find out that the problem or gap cannot be addressed by training. For example, it might be due to outdated equipment, or poorly arranged workspace. Training can't fix everything!

Create a Budget Choose Instructional Setting



Large \$\$ = Large cake



Small \$\$ = small cake

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You should know that there are two more big parts to analysis. Choosing the instructional setting and creating a budget.

It is important to look at the budget before you make the decision to have a workshop. You would not make a huge wedding cake for someone with a budget of only \$100. You need to match the cake with the budget or the training with the budget.

Likewise you cannot create a huge, complicated training course without a plan to pay for it. That is why it is important for the course designer and product line specialist to work closely together to avoid misunderstandings and subsequent problems.

Budget

- Revenue

- Grants
- Contributions
- Registration fees

- Expenses

- Travel
- Supplies
- Duplication
- Food
- Marketing
- Facility & AV rental
- Speaker fee
- Admin fee

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In creating the budget, possible expenses could include travel for staff and faculty, supplies (including office, lab, computer supplies), duplication (brochures and handouts), food services, marketing, facility and a/v rental, speaker fees and administrative costs.

Once you know your expenses you need to look at how you will generate the revenue to cover your costs. You could solicit support from one or more of your vendors, use grant funding, and/or charge a registration fee. Once you have determined the revenue sources, it is helpful to know the break even point. That is, how many paid registrants do you need to break even. If you want to make a profit you would have your minimum # of paid registrants exceed the break even point or charge a higher registration fee. There are many options.

Instructional Setting

- Live conference
- Teleconference
- Web conference
- CD/DVD
- On-line
- Satellite
- Train-the-trainer

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Choosing the instructional setting is a big decision, especially now that technology can play such a big part in the delivery. you have teleconferences, web conferences, podcasts, CD-ROMs, on-line training and so on. And the live courses can be wet workshops, seminars, or one of our favorites – a train-the-trainer. The train-the-trainer is not a new concept. In fact you might not be here without it. I love to tell the story of how in December of 1777, George Washington set up winter encampment at Valley Forge, Pennsylvania. But before long, disease and cold temperatures decimated the camp. Morale was low until German General Baron Von Steuben was brought in as an unpaid volunteer to train the American militia in European military formations and other strategies of war. When he saw the cold, disease-stricken, starved, and poorly supplied men, he knew that changes had to be made. Within a few days, Steuben picked a group of 10-12 men from different regiments to undergo training. The General spoke no English and cursed on a regular basis, but he still managed to communicate. In one instance, he wielded a musket and pantomimed the manual of arms. He creatively simplified and adapted the Prussian military drills to fit the colonial environment. Afterwards he split up the group, sending them back to their individual regiments, to teach the others what they had learned. This had a major impact in quickly teaching the majority of the army effective maneuvering. Within only a few days, Washington saw a considerable improvement in the coordination, awareness, and knowledge of his soldiers. Many say that the success of the Continental army during the Revolutionary War was due to the training they received at Valley Forge from Baron Von Steuben.

Analysis

- Target audience
- Core competencies
- Gap analysis (TNA)
- Budget
- Instructional setting



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Let's quickly recap the steps in the Analysis Phase.

- *define and study the target audience
- *determine core competencies
- *perform a gap analysis
- *draft a budget
- *choose the instructional setting

And in our wedding cake analogy you know the kind of cake you are going to make, and how much you can spend.

Design

- Instructional objectives
- Course description
- Agenda
- Outline or storyboard of content
- Assessment methods



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The next phase in the ADDIE model is “Design”.

In the wedding cake analogy this is where you decide on the flavor and shape of the cake, the number of layers, what kind of filling, kind and color of the frosting. In other words, what will the cake look and taste like.

During the “design” phase the course developer will write the instructional objectives, the course description, the agenda, an outline or storyboard of the course content and decide on the best assessment methods. What will the course look like and what will be included? The course developer usually consults extensively with SMEs or other expert references during this phase.

Instructional Objectives

Robert Mager

- Behavior

- Specific
- Observable
- Measurable

- Conditions

- Standard

Following instruction,
the learner will be
able to....

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you want to be sure you are designing the class around the desired outcomes and you want the sequence which will help the learners learn best. Robert Mager's guidelines for writing objectives suggest that they have three components. The **behavior** – which should be specific, observable, and measurable. The **conditions** under which the behavior is to be completed. The **standard** – the level of performance that is desirable.

To be sure you are writing objectives that are observable, you can begin them with the phrase...following the instruction, the learner will be able to... and follow that with an action verb. Some action that you can actually watch people perform. Let me give you an example: verbs not to use include "understand, know, and assess." You cannot observe or measure someone understanding... unfortunately there is no light bulb over their head. Instead use verbs such as "describe, define, chart, or classify."

Today the performance objectives in most training programs ignore an indication of the conditions and standards. When these are omitted, it's assumed that the conditions involve normal workplace conditions and standards are set at perfection or mastery. What is **always** included, however, is the most important criteria for a good objective, the observable and measurable behavior.

Objectives are the tools for guiding managers, learners, and trainers. Managers need objectives so that they know what kind of return they are receiving from their training investment. Learners need them so that they know exactly what is expected of them. And trainers need them to plan and conduct the learning environment so that they may achieve the desired results.

Course Description



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A short concise course description is needed so that the learner will know what the course is about. It is essential for marketing purposes, so consulting with someone with marketing expertise is encouraged because the course description helps to sell the course.

Agenda



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You want to create an agenda for the course which will best help the learners comprehend the content. Developing a sequence for the agenda is easier if you've done the analysis process well. Understanding the work is important...there's just a bit of "art" to this as well. Does the sequence feel right? Is it logical?

Outline or Storyboard of Content



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Writing an outline or storyboard of the content will help guide the presenters and SMEs so that they stay on track with the instructional objectives. If this course is a self-instructional module, the storyboard will be much more detailed. It will serve as a guide in communications with your programmers, graphic artists, and so on.

The cake order form is like the storyboard –

Like with the wedding cake, where the order form tells the decorator what colors and decorations to use, the storyboard guides the course development. The outline or storyboard minimizes do-overs.

Decide Assessment Methods

- Pre-post tests
- Quizzes
- Case studies
- Group activities



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During this phase the course designer decides on what type of assessment (tests, quizzes, group activities) will be done. The method of evaluation is also chosen.

Development

- Review existing materials
- Develop new materials
- Validate materials



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Now comes development. During development you start by reviewing the existing material so that you do not reinvent the wheel. You would not begin making our wedding cake by developing our own recipe! You would get out some well-liked recipes and choose parts of them that work for this wedding cake. Then you would go on to select and purchase the ingredients, mix the batter, bake the cake, make the filling and the frosting.

Course developers can save a lot of time by finding and incorporating existing instructional materials – Information technologists estimate that more than half a billion instructional and educational materials of various types exist in the English language. In spite of this, whenever instruction is indicated, the tendency is to create brand new training materials and packages. You need to remind ourselves to take the time to look on the Internet and check with your colleagues to see if there is something available you can use or modify.

The Training Coordinator Workspace is a place where you can easily go to look for parts of courses or products that you can reuse or modify. Try to put things in the Training Coordinator Workspace that will help your colleagues in the future during the course development phase.

Development

- Course content
- Student labs, group activities
- Case studies and job aids
- Pre/post tests
- Assessments and feedback



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Just like with mixing up the cake batter, beating the frosting, and cooking the filling, there are a lot of things to construct during the ADDIE development phase.

There is the course content to develop, -the presentations, but also student labs or group activities. Maybe some case studies and job aids for learning guidance. And the pre/post tests and assessments and then an evaluation to provide feedback. All to be constructed during this phase.

One of the trends in training is to make information available in podcasts, job tools and knowledge objects. This will allow grazing – A person taking just the information they need at the time. you like learning to be fun, so sometimes you include games and icebreakers if they are consistent with the learning objectives. (eating the roses off the top of the cake.)

Implementation



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Yes! you are finally at the point of conducting training.

And in our wedding cake analogy, this is where you assemble everything – the cake, filling, frosting, decorations into a beautiful presentation and deliver it to the bridal venue.

Implementation

- Workshop Timelines
- Memoranda of Understanding
- Plans for dates & sites
- Marketing plan
- Registration
- Supply purchases
- Site arrangements - food, AV, room set up
- Speaker arrangements
- Handout duplication and delivery
- Sign in sheets, name tags
- And so on

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There are many, many things to be done in the implementation phase so you need a management plan. Two of the things you use a lot for managing the implementation phase are workshop timelines and memoranda of understanding. These are lists of who is doing what and when. They can be very helpful in preventing things from falling through the cracks.

Related but Different

- Development



- Implementation



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In the ADDIE model, it might appear that Implementation **follows** Development. But remember this is not a linear model. In reality implementation often runs concurrently with development because some of the implementation steps require long lead times - like reserving rooms, etc. The two phases have very different tasks, so different team members are often involved. One suggestion for making this process work better is to ask yourself, who needs to discuss this particular issue. Is this a content development issue where the course designer and SME primarily make decisions? Or is this an implementation issue where an office assistant or other team member can help by organizing things? If you have non-technical help for conducting your course, it is wise to involve those individuals in course implementation.

It might help to remember that course designers are primarily working on development of content with the SMEs. It is not efficient to involve the SMEs in course implementation details.

The two parts - development and implementation are related, but different. They can involve two different sets of people, depending on the size of your organization.

Using SMEs

- *Part of* instructional design process
- Training Goal
 -  • change behavior, improve skills
 - sharing every detail
- Offer them lesson plans and guidance
- Questions trainee will be able to answer
- Facilitate activities

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There is another aspect of the process that you would like to briefly address - making the best use of subject matter experts or SMEs. Using subject matter experts can greatly speed up the design and development phases of the instructional design process. But remember, it is dangerous to work under the assumption that if someone knows the subject, they are ready to design, develop, and deliver the training program.

Subject matter experts can become part of the instructional design team with the right coaching. Here are some hints: *Involve the SMEs in the design of the instructional materials or package, but emphasize that the goal of training is to change behavior and improve skills on the current job, not to cover every glorious technical detail about the topic. (Remember, you are doing training, not education) *Provide lesson plans to structure and guide the SME. *Encourage the SME to put those glorious details into a handout, technical manual, or similar document *List a series of questions that the trainee should be able to answer at the end of the lesson. *Ask the SME to help design several interactive activities in the instructional materials so that learners can practice.

Remember that the SME is assisting in the design, development and delivery, he/she is not the course designer. That is your job and you are good at it. Don't abdicate your responsibility to the SME.

Evaluation

- Post tests
- Lab practical
- Evaluation forms



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The final phase is “Evaluation.” Here is where you find out if the cake is as good as it looks!

You use evaluation to see if the learners are satisfied with the training experience (did the cake taste good?) but also to determine if the training meets our quality standards. You set quality standards related to accrediting agencies – the agencies that award continuing education credits. It is essential that you show that every course you conduct or every product you create meets quality standards. Without the evidence of quality as documented by the evaluation results, you will not be able to award continuing education units and maintain funding.

The forms you have our learners complete at the end of the training are a part of the evaluation process. Post tests or lab practicals fall into the category of evaluation. It is very important that any post tests follow the learning objectives – remember those?

Evaluation

- Impact
- Enhanced Quality Assurance focus

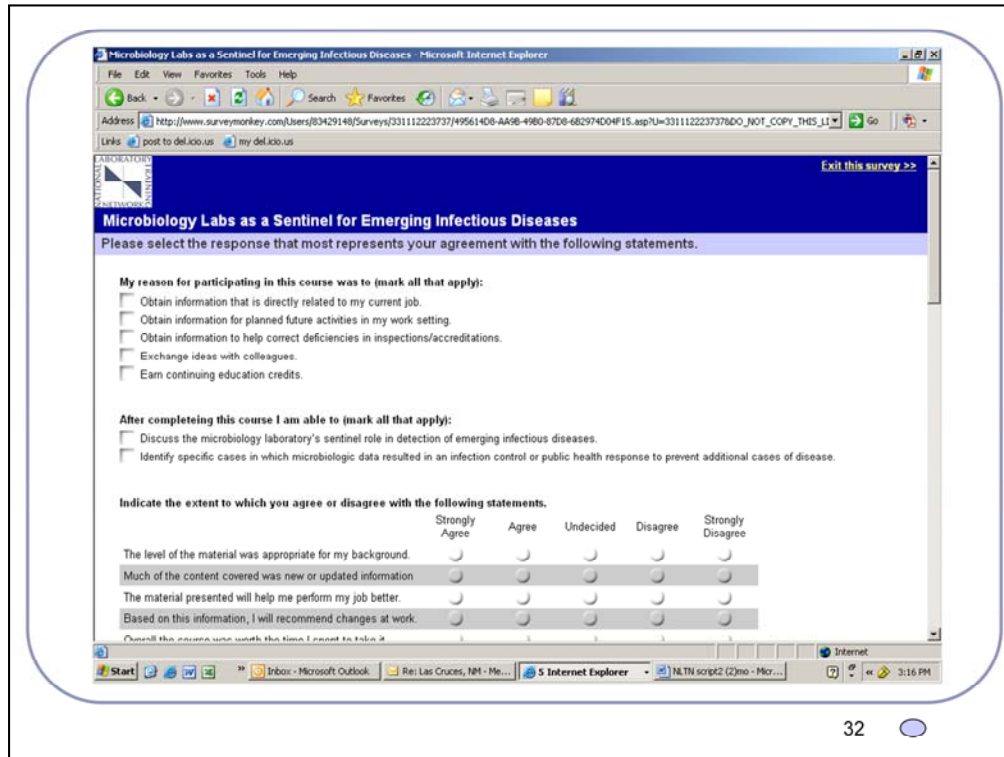


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Another important aspect is impact evaluation. For impact evaluation you often use pre and post course practices assessments to see if any of the students' laboratory practices changed as a result of the instruction. If the course helped people change a poor practice to a better one, you can say that the course had a positive impact on the students and their laboratories.

Impact evaluations can be done in other ways as well – you could interview the learners' managers, or track laboratory-related statistics.

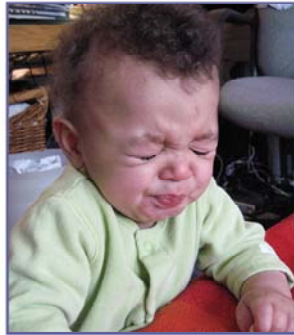
Evaluation results assist in improving future offerings of this particular course or perhaps even other courses. – What if the cake is great when it leaves the bakery, but sits in the truck too long and then tastes bad. Evaluation will tell us you need a refrigerated truck or a different delivery schedule.



One device you can use for both TNAs and evaluations is Survey Monkey. Survey Monkey is software that lets you create professional online surveys quickly and easily. You design the layout of your survey from the background colors to the format of the questions. Once your survey is created, you simply send your participants a link to the survey. Data is collected in real time, responses can be tracked, and the results can be imported into Excel for data manipulation. It's important to remember that people are more inclined to complete a survey if it is easy and quick for them to do. This program eliminates the need for paper surveys that have to be faxed or mailed back and it saves the trainer time by eliminating the need for hand tallying of responses. Better response rate equals better data that allows you to identify training gaps and determine course quality.

So... here is an evaluation question for you..... (next slide)

Evaluation

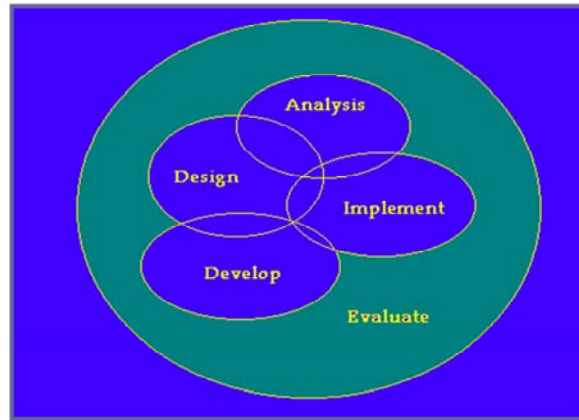


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On a scale of 1 to 4 with 1 being the best ever, how would you rate this cake?

ADDIE



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Hopefully during this presentation you learned a little something about the ADDIE model and how it relates to your work. Much more about the ADDIE model is available online or in reference books.

Happy Instructional Design to you!