What Affects Learning?

What did we do last week?

- Differentiated among knowledge, skills, and attitudes
- Identified the five phases of the Instructional Systems Development Model
- Defined Learning
Learning Objectives

• Explain the factors that affect learning.
• Identify the components of the Learning System.
• Identify the five phases of the ISD system, in order.
• Differentiate among the eight forms of analysis performed in the Analysis Phase of ISD.

Factors Affecting Learning

– Motivation
– Organization
– Participation
– Confirmation
– Repetition
– Application

Factors Affecting Learning

Motivation

• Generally . . . The greater the want or need to learn, the more learning will take place
  – Stating a goal for the learner will strengthen motivation
  – The goal must be clearly understood
Motivation

• Knowledge of progress enhances motivation to learn more
• The imminence of use will encourage motivation

Factors Affecting Learning

Organization

• There is a tendency to see and organize patterns or relationships, BUT unaided, this tendency may not always result as it should.
• The more meaningful the material is to the learner, the better he will organize and learn it.
  – Demonstrate (Show it)
  – Explain how it will help do the job better, faster, safer, etc.

Factors Affecting Learning

Participation

• People learn only through their own mental and physical activity
• Learning is enhanced thorough participation
  – Show them -- step by step
  – Visualization and verbalization
  – Actually practice it
Factors Affecting Learning

Confirmation

• If learning is assured, it must be confirmed in the mind of the learner.
  – Needs to know if the response was right or wrong
  – Must know why it was right or wrong

Factors Affecting Learning

Repetition

• Mere repetition has little, if any, strengthening effect on learning.
• It must be accompanied by favorable “conditions”:
  – proper motivation
  – meaningful organization
  – continuous participation
  – confirmation

Factors Affecting Learning

More Repetition

• “Overlearning” is very important.
  – Practice over time
  – Use “Whole-Part-Whole” process
  – Learning is favored when practice is spaced over intervals of time
  – Minimum of delay is the key to efficient learning
Factors Affecting Learning

Application

• The application or transfer of new knowledge to a new problem or situation cannot be assumed
  – There must be specific training for transfer.

Training For Transfer of Learning

– Calls for realistic situation
– Must be taught generalizing and application of new knowledge in similar situations
  • Generalizing means helping them to use the new skills and knowledge in different situations and environments.

Factors Affecting Learning

Individual Differences

• Learner’s individual differences are as important as all other factors combined.
  – Intelligence
  – Education or experience level
  – Specific aptitudes (spatial, mechanical, verbal, perceptual speed, . . .)
  – Physical abilities
  – Attitudes and interests
  – Preferences in teaching methods/techniques
What’s it all mean . . .

Learning Process for Instruction

- Learners need to know **WHY** they should learn
  - What is expected
  - Statement of quality or level of performance expected
  - Statement of conditions under which the learner must perform

- Learners need **meaningful training content**
  - Learning is most meaningful if linked to job experiences and needs

- Learners need **opportunities to practice**
  - The mental or physical rehearsal of the task, knowledge, or skill

- **Practice involves experience**
  - This means doing it (hands-on, role play)
• **Massed vs. Spaced Practice**
  - Massed -- practice continuously
  - Spaced -- given rest or breaks between practice sessions (best method)

• **Learners need to commit content to memory**
  - Storing important information
  - Develop concept maps, use multiple forms to review info, teach key words, cues)

• **Learners need feedback**
  - How well they are meeting learning objectives

• **They learn through observation, experience, and interacting with others**
  - Show them, have them practice, work with others doing it (teams)

• **Learners need the program to be properly planned and arranged**
  - Communicating courses/programs to students/employees
  - Advising them properly
  - Enrolling them
  - Preparing and processing pre-training materials
  - Preparing materials used in instruction
– Arranging the training facility or room
– Testing equipment before starting
– Having backup equipment
– Provide support during instruction
– Distributing evaluation materials
– Facilitating communications during and after training
– Recording course completion in records

What are the components of the Learning System?

Components of a Learning System

- The Learners
- The Instructor
- The Instructional Materials
- The Learning Environment
A Review
What did we do?

• Looked at the Factors that Affect Learning
• And discussed the Components of a Learning System

Objectives

• Identify the main phases on the ISD Process.
• Explain why a system approach is used to plan instruction.
• List the eight different types of analysis contained in the Analysis Phase of ISD.
Why use a systems approach?

• Focuses on what the learner must know or be able to do when instruction is complete.
• Careful linkage of the components.
• Design is replicable.
• Includes a systematic continuous improvement process.

**ISD**

*Instructional Systems Development*

*Sometimes called*

*Instructional Systems Design*

**ISD Process -- 5 Phases**
Phase 1

• Analysis Phase

The Eight Different Types of Analysis

• Needs Analysis
• Problem Analysis
• Goal Analysis
• Population Analysis
• Resource Analysis
• Constraints Analysis
• Job Analysis
• Task Analysis

Needs Analysis...

• What’s the real need for training -- honestly and truthfully.
The Training Gap

- KSA needed
- "The Training Gap"
- KSA Known

Problem Analysis

- What's causing the problem?
  - Use surveys, interviews, observations to narrow down and isolate a problem's cause(s).
- The solution may not be training

Problem Solving Analysis

Ask the questions . . .

- What is happening at present?
- Who is affected by it?
- Where is the problem evident?
- What should be happening?
- How wide is the gap between what is and what ought to be?
Find out if the problem can be solved with training . . .

• What general methods could be used to solve the performance problem?
• What would each method cost?
• What improvement method would likely have the greatest worth?

Goal Analysis

• Identifies the important goals of all people who have a legitimate interest in the training program’s outcomes

Population (Person) Analysis

• Describes the characteristics of people who ought to or are likely to participate in the training program.
  - Who are those not meeting the performance standard?
Population Analysis --
Such as . . .

- Demographics (age, gender, race)
- Knowledge and skills (education & experience)
- Performance
- Aptitudes
- Learning style
- Attitudes (Feelings)

A Population Description

- What you are trying to do is:
  - Find the course substance (content). It is derived by subtracting what the learner already knows or is able to do from what the job requires him or her to know or do.

<table>
<thead>
<tr>
<th>Course Substance</th>
<th>What Job Requires</th>
<th>What He/She Knows</th>
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</thead>
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Prospective Learners

- The course content and methods of instruction is heavily influenced by the kind of trainee or student who shows up for the course.
- It is very important that the course is designed for the trainees as they really exist, not as management hopes they exist.
Resource Analysis

• Identifies what resources will be available and useful to program developers and instructors/facilitators.

• What is already available, or will be available to help develop and implement the instruction.

These include:

– space for classes
– labs
– workshops
– media such as off-the-shelf training materials
– computers, actual job equipment or mock-ups/simulators
– books
– periodicals
– audio- and videotapes
– subject-matter experts

Constraints Analysis:

• A developer needs to know the constraints on developing and presenting a training program as well as available resources.

• Usual constraints include limitations in:
  – budget
  – availability of resources
  – and availability of the time of training
  – participants or instructors/facilitators.
  – A designer must consider all known limitations from the outset and plan around them.
• For example, if the best lecturers on a topic live in places distant from most of an organization’s training locations – videotaped courses may be a preferable alternative to paying lecturers’ travel expenses to training sites.

• If the problem isn’t lack of money, but lack of lecturers’ time – teletraining by video-conference might be the solution.

Job Analysis:

• Before people can be trained for a new job, someone must identify the duties and responsibilities included in the job.

• A job analysis yields a breakdown of job responsibilities.

• Consider the job of retail cashier: Major responsibilities might include:
  – greets customers,
  – takes cash for purchases
  – processes charge purchases,
  – keeps inventory,
  – records information for delivery of purchases.

• Job analysis data will help an instructional designer determine the objectives and goals for a training course.
Writing Job Descriptions

- A job description is a general statement about what a person on the job does, and tells something about the conditions under which he does them.

- It is NOT a description of what he knows. A job description is generally only a paragraph or two long.

The Job Description is the first thing you look at before developing the Task Analysis.

Task Analysis

- Breaking down the job duties and responsibilities into:
  - individual tasks
  - and each task into steps

- Important Steps . . . because the information becomes the content for any instruction you plan.
So, to do the Task Analysis . . .

1. Start with Job Analysis, review it for content -- verify it.
2. Then list ALL the tasks required to do the job or perform the skill (Task Listing).
3. Then list the steps for each task (Task Detailing).

Task Listing Example 1
Job: Service Station Mechanic-attendant

1. Replace spark plugs.
2. Adjust and bleed brakes.
3. Replace wheel cylinders.
4. Inspect and flush radiators.
5. Test antifreeze.
6. Repair tube or tubeless tires.
7. Rotate tires.
8. Lubricate vehicles.
10. Replace air cleaners.
11. Clean or replace gas filters.
12. Wash and wax autos.
14. Replace oil filters.
15. Check oil, brake fluid, power steering, other fluids.
16. Wash windshields, replaces blades.
17. Fill gas tanks, radiators.
18. Maintain daily records of sales, inventory changes.
19. Order supplies.
20. Open and close station.

Task Analysis

Task Listing
Service Station Attendant

Task Detail
Clean or replace spark plugs

1. Note the plug location relative to the cylinder.
2. Remove all spark plugs.
3. Identify the type of plugs.
4. Decide whether to adjust or replace plugs.
5. Clean plugs, if necessary.
6. Replace spark plugs in engine.
7. Connect ignition wires to appropriate plugs.
8. Check for performance.
9. Clean tools and equipment.
So Far . . .

- Collected data about needs, problems, goals, resources, constraints, prospective learner population, job, and tasks.

Next is the . . .

- Design Phase

Design

- Write the objectives from the task analysis
- Write the test items for each objective
- Plan the instructional sequence
- Plan the instructional strategies
The Third Phase is the . . .

• Development Phase

Development

• Training materials
  – For instructors and students/trainees

• Program evaluation materials
  – For during instruction
  – For follow-up after the course

• Training documentation
  – class attendance forms, evaluation forms, lists of participants’ completed education/training
  – course documentation

• Management Plan

Implementation is next!

• Implementation Phase
Implementation Phase

- Students arrive and the course is taught and participants’ learning is evaluated.
  - Management plan started
  - OJT Begins, Classroom presentations, Self-paced instruction
  - Information is collected

Phase V

- Evaluation Phase

Evaluation Phase

- Analyze trainees’/students’ performance during the course
- Analyze the completers’ performance after the course.
- Analyze how the course ran.
- Check the workplace to see how it has changed
So that's ISD

• Analysis
• Design
• Develop
• Implement
• Evaluate

5 Phases!

Followup

• Check Web Site for study questions for this lecture.

• Quiz on Sep 27
  – It will cover this stuff . . . As well as more.

Bye!

Quiz
next week!