APPENDIX P

Tip Sheets for Development

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Tip-P.1: CONTENT – *Too much* versus *Not enough*

The “content” part of a Lesson plan consists of detailed subject-matter content and procedural information for teaching your lesson or lecture part of the course. The content provides the instructor with:

- Overview of knowledge, skills or attitudes to be taught.
- Background information to enhance the training.
- Teaching outline/script.

What it is **NOT**, is the “nice to know” information that a designer or instructor feels needs to be included in the lesson, but does not directly tie to the lesson objective.

When we refer to “content” we are referring to the bulk of the lesson text, that information that supports the lesson materials in the Student Guide or other instructional materials.

- Provides standard instructor notes on delivery techniques
- Includes sufficient detail on key information
- Includes standard instructor questions for prompting student response
- Reference to applicable PowerPoint slides as applicable

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Tip-P.2: What Level 2s Are and Are Not

Now that you're at the "develop" stage, it is time to talk about test **validity**, **reliability**, and **practicality**. We'll go over what each of those terms means:

Validity. A test is valid if it actually measures or assesses what it claims to measure or assess. A test is valid if:

- Its individual items are consistent with the objectives the test claims to assess.
- The items for each objective are representative of the **range** of items possible to develop for that objective.
- Objectives upon which the test is based have been adequately sampled.

Reliability. A test is reliable if it consistently measures what it claims to measure, and we have a high degree of confidence in the scores that it produces. Tests are considered unreliable when something causes unpredictable error. Some of the ways you can ensure your test instruments are more reliable are:

- Avoid essay questions. It is very hard to grade them objectively and consistently. Therefore, they are not particularly reliable measures. If you have to use the essay format, use checklists, model responses, key words, or phrases to ensure more objective evaluation.

If you are testing competency, make sure your test distinguishes between skilled and unskilled learners.

- Do **NOT** use true/false questions. There is a fifty-fifty chance learners will get a true-false item correct.
- Use at least three distractors (i.e., wrong answers/choices) when constructing multiple-choice questions. Each additional distractor reduces the possibility of getting the correct answer by guessing.
- Watch test length. Too few test items, per objective,increase the likelihood that the successful test taker won't really have learned the job. Using only one item per objective means the student may guess the right answer.
- Edit test items for clarity and easy-tounderstand/interpret directions. Ambiguity can result in an unreliable test instrument.
- Unexpected or hostile conditions for taking the test can make it unreliable (e.g., too hot or cold, using a computer for the first time, excessive anxiety, etc.).
- Use a checklist or rating form, and practice grading all of one question for the entire class to increase test reliability.

Tip-P.2: What Level 2s Are and Are Not, Continued

Practicality. Time constraint mean that there is a trade off between making a test instrument valid and reliable and the realities of our work world. In short, as test designers and developers, we've got to balance practicality with reliability and validity. The one time we don't want to compromise on ensuring high reliability and validity is for situations that involve life or death decisions. For example, for safety tests, certifying people in administering CPR, etc., we want to make sure our tests have high reliability and validity. Your test items should be consistent with the performance objectives they're supposed to measure. Make sure the performance you are asking students to do in the test matches the performance indicated in the objective.

What types of tests can you develop?

- **Performance tests.** These tests measure skills. The learner must demonstrate the ability to do something such as operate equipment, drive a ship, or speak a foreign language. Simulations can be used for performance tests. In some cases, practicality will dictate that you have to develop a test that requires a performance equivalent to the one desired but not exactly the same
- **Knowledge tests.** There are two types of knowledge tests--**subjective** and **objective**. Essay questions are an example of a subjective knowledge test, but we've already told you to avoid using them unless you absolutely have to. Objective knowledge tests are:
    - Oral
    - True/false (do **NOT** use!)
    - Multiple-choice
    - Matching
    - Completion (fill in the blanks)

Given these choices, what types of tests should you develop for particular objectives? The answer to that question depends on the learning capability you are testing (i.e., verbal information, intellectual skills, motor skills, or attitudes). These are the things you want to think about when you are developing test items for the different learning capabilities:

Verbal information. Use the conditions and behavior parts of the performance objectives to guide your development work. Short answer, completion, or "fill in the blanks" are your best choices.

Tip-P.2: What Level 2s Are and Are Not, Continued

Intellectual Skills. Make sure students are given the materials specified in the conditions part of the objective and that they are required to respond in the same manner specified in the objective's performance statement. Try to make directions separate from the test item.

To help ensure directions are clear, state the intellectual skill to be performed first, then follow that with instructions about how to respond to demonstrate the skill.

Motor Skills. To measure performance of motor skills, you need instructions for the performance and a checklist you can use to record your evaluation of the performance. Be sure instructions tell the students how their performance will be judged.

Attitudes. For training that focuses on leadership or diversity, we suggest you use a checklist or rating scale survey for evaluating change in attitudes. For example, if you wanted a trainee to demonstrate a courteous manner toward customers, you could develop a checklist to be used when observing the student's behavior during a roleplay, etc.

***NOTE**: For an exhaustive list of "do's and don'ts" for test item construction, we strongly suggest you use Training Center Yorktown's HPT Handbook. It contains a wealth of information on good test item construction, as well as numerous examples that serve as test item models.*

Tool: See **Do's and Don'ts For Various Types of Tests** chart at the end of this chapter. It will help you avoid some of the common mistakes in test item construction.

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Tip-P.2: What Level 2s Are and Are Not, Continued

ICW tests: See the Coast Guard's **ICW Standards and Styles Guide** for guidance in developing ICW product tests. We've extracted some of that information and reproduced it below:

- Provide an initial screen at the beginning of a test that states the number of test items and estimated time for completion.
- Provide an escape option for anyone who wants to back out at this point.
- At a minimum, show items that were missed. (Students may recall wrong answers as correct if this is not done). Consider reviewing wrong items by showing the wrong answer selected along with the correct answer.
- Just as with any type of test item construction, avoid using:
- None of the above
- All of the above
- True/False
- Negatively worded test items
- When you have to use a negatively worded test item, capitalize the negative terms and underline them (e.g.,NOT).
- Write completion items so that only one word, phrase, or value completes the sentence. Place the blank near the end of the sentence.
- Use a pre-test at the beginning of a module to collect information about the user such as prior knowledge of the material, learning style, and preferences.
- Use progress checks to determine if the learner is progressing as intended. The CBT can use this information to provide guidance to the users or send them to an appropriate section. The progress check also informs students of how they are doing and then lets them choose what to do next.
- Use a post-test to certify that the user has reached a specific level of proficiency. Be sure you "trap" the answers so that data are recoverable.

Tip-P.3: Media Format and Instructional Strategy

Advantage and Limitations

Depending on the training situation, instructional media have distinct advantages and limitations. Some of these factors are summarized below. Consider them carefully when selecting instructional media.

DELIVERY FORMAT	ADVANTAGES	LIMITATIONS
Classroom Instructor	• Cost-efficiency • Target audience preference • Versatility, flexibility, adaptability to audience and situation	• Instructor skills and experience in the method(s) specified • Few or no take-away's
Print	• Includes common types of materials • Variety and ease of application • Simple materials may be produced quickly and inexpensively	• More sophisticated materials require more time and money to produce • Literacy level of learners • Static presentation • Periodic/time-consuming updates
Audio Visual (i.e. PowerPoint, images, video clips)	• Can present information in systematic, developmental sequences • Simple media may be produced quickly and inexpensively • Very efficient with large groups • Equipment is readily available • Useful when visualizing motion, showing relationships, and providing impact • Can be reused	• More sophisticated media require more specialized skills, time, and money to produce • Investment in equipment may be reduced as new technologies emerge • Design must engage learner responses to avoid passive learning conditions
Interactive Multimedia Instruction (IMI) (i.e. instructional video, Multimedia / 3-D modeling, CBT, simulators, etc.)	• Can engage learners through impact and involvement • Can compress large amounts of information into a short presentation • Can provide more effective communication than a single medium • Can be customized for learner needs and knowledge level	• Equipment and production costs are high for complex programs • May require additional equipment, complex set-up, and careful coordination during planning, preparation, and use • Specialized production staff required ***Developers should refer to ADL SOP and contact appropriate E-learning specialist.*
Training Devices (i.e. Simulators)	• Students are able to practice a full range of skills in a high-fidelity simulation with operational equipment, including emergency or contingency scenarios which are not practicable in the actual performance setting. • Simulators provide a complete set of cues and consequences related to the performance requirements.	• Simulators are expensive to develop and maintain. They require revision to keep pace with technological and operational change. Practice is limited to the number of available simulators.

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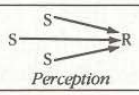
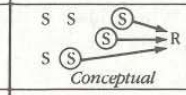
Tip-P.4: Suggested Training Media and Learning Methods for Various Learning Problems

Figure 14. Suggested Training Media and Learning Methods for Various Learning Problems

Orientation	Integration	Thought Process	Level I S→R *Reaction*	Level II S→R, S→R *Sequence*	Level III  *Perception*	Level IV  *Conceptual*
Visual	*Questioning*	*Systematic*	Workbooks Demonstrations Presentations/ Discussions Reference Manuals	Presentations/ Discussions Checklists Workbooks Job Instruction Training (JIT)	Presentations/ Discussions Workbooks Q&A Books Reference Manuals	Cases/In-Basket Exercises Group Discussions Reference Manuals Problems Experiments
		Intuitive	Demonstrations Presentations/ Discussions Reference Manuals	Workbooks Presentations/ Discussions Demonstrations JIT	Games JIT Case Problems Video	Cases/Games Role Playing Exercises/In-Basket Exercises
	Adaptive	*Systematic*	Programmed Instruction Instructional Manuals Repetition	Programmed Instruction In-Box Exercises Checklists Workbooks	Programmed Instruction Reference Manuals Video Modeling	Programmed Instruction Reference Manuals Modeling In-Basket Exercises
		Intuitive	Programmed Instruction Demonstrations	Programmed Instruction Demonstrations In-Box Exercises	Modeling Video Exercises	Modeling In-Basket Exercises Games
Auditory	*Questioning*	*Systematic*	JIT Demonstrations	JIT Demonstrations	Case Problems Video	Case Problems Coaching
		Intuitive	JIT Coaching Demonstrations	JIT Coaching Demonstrations	Case Problems Video Buzz Groups Exercises Coaching	Role Playing Case Problems Buzz Groups Exercises Coaching
	Adaptive	*Systematic*	Demonstrations Audiotapes JIT	Demonstrations Audiotapes JIT	Lectures Modeling Video	Lectures Modeling
		Intuitive	JIT Coaching Demonstrations	JIT Coaching Demonstrations	Modeling Buzz Groups Exercises Coaching	Modeling Buzz Groups Exercises Coaching Role Playing
Physical	*Questioning*	*Systematic*	JIT Repetition Practice Coaching	JIT Repetition Practice	Coaching JIT	In-Basket Exercises JIT
		Intuitive	Experiments JIT Practice Games	JIT Practice Experiments	Role Playing Case Problems Games Exercises	Role Playing In-Basket Exercises Games Exercises
	Adaptive	*Systematic*	JIT/Coaching Repetition Practice Programmed Instruction	JIT Repetition Practice Programmed Instruction	Modeling Programmed Instruction Coaching	In-Basket Exercises Modeling Programmed Instruction
		Intuitive	Practice JIT Games	JIT Practice	Role Playing Games Simulations Exercises	In-Basket Exercises Games Simulations Exercises
Content design should provide these learning methods:			• Associations • Coaching • Imagery • Mnemonics	• Reversals of Sequence • Imagery • Memory Links	• Motivation • Theory • Objectives • Common Denominators • Concepts • Analogies • Overviews • Categories • Generalizations • Discriminations	• Patterns • Filters • Background • Hypotheses • Confidence • Strategies • Decision Trees

Reference: Planning, Packaging, and Presenting Training: A Guide for Subject-Matter Experts, by Gene E. Custer, University Associates, Inc: San Diego, CA, page 54, 1984.

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