

Chapter 5

DEVELOPMENT PHASE

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5.1 – Chapter Introduction

Phase Overview

Synopsis

The third phase in the Instructional Systems Design (ISD) model, or ADDIE, is Development. In this phase the course designer takes the blueprint created in the earlier phases and pulls it together to develop supporting course materials, such as: training aids, job aids, and lesson plans.



Note: Remember, though, the work of course design and development is often performed as one task and it isn't linear in process. Many development efforts can be ongoing or initiated while the developer is still "in the Design phase."

Audience

Primary Audience: Coast Guard (CG) Training Center active duty course developers and instructional designers, as well as CG civilian course developers and instructional systems specialists.

Secondary Audience: CG Training Center Performance Systems Branch managers supporting the instructional designers/course developers; the subject matter specialist; the ISD project managers, project leads, or project coordinators, school chief and others who have been identified as having some role in the ISD process. Additionally, the secondary audience may include instructional designers employed with contracted companies performing instructional design for the CG, or equivalent individuals who have curriculum/course development responsibilities, including instructors performing course maintenance with ISD oversight.

Phase Overview, Continued

Purpose The Development chapter of this SOP is composed of sections that are to be completed in relative sequence. Each section and its associated tasks (for development of that specific deliverable) will direct course developers to a specific job aid for detailed guidance on how to perform the task. Each section will provide guidance on the development of materials to support activities common to resident instruction.

The material in this chapter expands on the information that graduates of the Coast Guard's Course Designer Course (CDC) are taught. Since technology will continue to overcome current methods and offer exciting possibilities to course developers, this chapter of the SOP has been crafted so it will provide the essentials you need today, but also position you to take advantage of tomorrow's development methodologies.

Inputs There are several items that you need as inputs from previous phases of ADDIE before you can embark on development of instructional materials.

You must verify you have the following information before continuing on:

- Task analysis/task detailing (*WS-F.1*)
- Target audience profile (*WS-F.2*, also *TIP-H.5* on target audience characteristics)
- Course Parameter & Constraints (*WS-F.3*)
- Terminal Performance Objectives (written at the task level, from Design phase)
- Design blueprints (from Design phase)

NOTE: *Due to the varying quality and types of data input sources, the requirement for comprehensive and accuracy data, as well as the range of data details and considerations required when making instructional decisions, it may be advised throughout the chapter to consult with an ISD professional, or graduate of one of the following approved curriculums:*

- *Coast Guard Course Designer Course (CDC)*
 - *SABA Knowledge Service Peak Performance System workshops (previously known as Accomplishment-Based Curriculum Development (ABCD) workshops)*
-

Phase Overview, Continued

Outputs

The Development chapter of this SOP contains information on the following possible outputs/deliverables needed to support any course development effort:

- Job aids
- Performance tests
- Remediation plans

Instructional activities, including:

- Content analysis
- Practices
- Demonstrations

Instructional materials, including:

- Instructional media (handouts, PowerPoint presentations)
- Student guides/student workbooks
- Instructor guides

Evaluation of instructional materials, including:

- Technical accuracy verification
- Quality assurance ISD review
- Developmental/beta testing

Note: *Often a final deliverable is development of the curriculum outline (CO). The draft CO is often initiated upon completion of Terminal Performance Objectives, and completed throughout the development process. This is recommended, but that process is not discussed in this SOP. For more information, refer to SOP, Vol. 6: Curriculum Outline.*

Phase Overview, Continued

Process Overview

The key events in the course development phase are outlined below. Note that we list these events in a sequence that is provided only as an aid to understanding the development process. Depending on your projects, some events may be skipped or iterations among some events may be necessary. The actual events of development to be applied to a specific project and their sequence shall be documented in a POAM.

Event	Action		
1.	Develop job aids.		
2.	Develop performance tests.		
3.	Develop remediation plan of instruction.		
4.	Develop instructional activities (based on lesson design plan): <ul style="list-style-type: none"> • Presentation • Practice • Demonstration • Review 		
5.	Conduct content analysis (to finalize lesson plans with the “need to know” information)		
6.	Produce instructional material / media: <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Advance assignments • Glossary • FAQs and answers • Handouts </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Information sheets • Handouts • Student guide • Presentations </td> </tr> </table>	<ul style="list-style-type: none"> • Advance assignments • Glossary • FAQs and answers • Handouts 	<ul style="list-style-type: none"> • Information sheets • Handouts • Student guide • Presentations
<ul style="list-style-type: none"> • Advance assignments • Glossary • FAQs and answers • Handouts 	<ul style="list-style-type: none"> • Information sheets • Handouts • Student guide • Presentations 		
7.	Compile Instructor Guides		
8.	Evaluate instructional materials: <ul style="list-style-type: none"> • Perform technical accuracy and user acceptability review • Quality assurance ISD review • Perform developmental and/or beta tests 		
9.	Manage the course development process.		

5.2 – Job Aids

Introduction

Overview

Job aids are repositories for information, processes, or perspectives that are external to the individual and that support work and activity by directing, guiding, and enlightening

performance¹. Simply, job aids are a storage place for information other than human memory.

Job aids support task performance by helping members with tasks that are done infrequently, are too complex to memorize, or that are comprised of steps that are critical. The intention of a job aid is NOT to assist in remembering particular steps, job aids are intended to assist in the recall of those steps.

What a Job Aid is NOT: It is not a tool, even though it supports work performance. A job aid is not intended to help students achieve long-term retention although sometimes in the learning process a job aid is used early on to familiarize students with the steps they are expected to be able to perform by memory. Job aids provide steps, illustrations, and examples that keep performance on track, and accomplish a particular output.

A detailed process for job aid development is outlined in the *SOP, Vol. 4: Job Aids*. This SOP will not duplicate what can be found in that SOP, but only present the information, as needed, for consideration this during your development efforts.

Purpose

Job aids enhance a person's performance and approach to a task so it's important to spend the time to develop appropriate, quality job aids early on. Job aids are used largely because of limitations on memory. It facilitates the learning process since many tasks do not have to be trained to memory. It's more productive for learners to realize they can use something "on the job" to assist them in correctly performing a task, rather than having students struggle through remembering how to do it and have potential negative consequences for incorrect performance.

¹ Rossett, Allison and Gautier-Downes, Jeannette. (1991). *A Handbook of Job Aids*, pg. 31-32. Jossey-Bass/Pfeiffer: San Francisco, CA.

Introduction, Continued

Applicability

We should choose to develop job aids in the following situations:

- When the performance is infrequent
 - When the situation is complex, has multiple steps, or has multiple attributes
 - When the consequences of error are severe
 - When performance depends on a large body of information
 - When performance is dependent on knowledge, procedures, or approaches that change frequently
 - When employee performance can be improved through self-assessment and correction with new or emphasized standards in mind
 - When there is high turnover and the task is simple
 - When there is little time or few resources to devote to training²
-

Inputs

The following information is needed before you can begin development of job aids:

- FEA (analysis) with task and step-level data (*SOP, Vol. 2*)
- Performance support decisions (job aid versus memory)
- Task analysis/task detailing (*WS-F.1*)
- Terminal Performance Objectives (TPO)
- Evaluation Criteria Decisions (*WS-F.2*)

**Graduates of one of the approved curriculum (listed below) shall perform the task analysis or job aid analysis (if not already done so), in accordance with the guidelines and curriculum standards in that appropriate SOP.*

² Rossett, Allison and Gautier-Downes, Jeannette. (1991). *A Handbook of Job Aids*, pg. 31-32. Jossey-Bass/Pfeiffer: San Francisco, CA.

How to Develop Job Aids

Outputs

The final job aid should be a repository of information external to the individual that:

- Will assist the learner in performing a particular task in the same manner, with the same result, each time he or she performs that task.
- The learner can use when back on the job, so that he or she doesn't have to memorize what is being taught during the course.

Approved Curriculums for Development

The development of job aids is detailed in *SOP, Volume 4: Job Aids* so extensive guidance is not included herein. Also, because Coast Guard job aid development defers to one of the below approved curriculums, it is advisable to consult with an ISD professional or graduate of one of the following approved curriculums for further guidance:

- Coast Guard Course Designer Course (CDC)
 - SABA Knowledge Service Peak Performance System workshops (previously known as Accomplishment-Based Curriculum Development (ABCD) workshops)
 - JAWS (Job Aid Workshops), a segment of the ABCD curriculum often taught separately
-

How to Develop Job Aids, Continued

Steps

Coast Guard procedures for producing Job Aids, per *SOP, Volume 4* are summarized below. Please refer to a graduate of one of the approved curriculums (listed above) if you need further guidance.

Step 1: Collect task data:

- Task data collected for tasks requiring a job aid.
- The training support (job aid vs. memory decision) for each task

Step 2: Sort task data through memory versus job aid filter (if not already done so as part of FEA).

Step 3: Sort tasks to be included in job aids through training support filters (if not already done so as part of FEA).

Step 4: Design and develop job aids using one of the approved curriculums.

Formats: Decision Table, Algorithm, Cookbook, Worksheet

Step 5: Validate the draft job aid.

Step 5a: Edit the draft job aid (content, structure, language).

Step 5b: Conduct trials (beta test) for draft job aid.

Step 5c: Revise the draft job aid.

Step 6: Troubleshoot the draft job aid (optional).

Step 7: Submit the job aid for approval.

Step 8: Deploy the official job aid.

Step 9: Maintain the job aid.

How to Develop Job Aids, Continued

Example

Below is an example of a job aid, worksheet (for completing a form used by Food Service personnel). *Appendix O* contains additional examples.

Job Aid: REIMBURSABLE FOOD ITEMS: DD-1149

Purpose: The most common activity that triggers the use of this form is AMIO. The DD-1149 allows you to document rations for meals served to destitute persons taken aboard. You will track the actual number of meals served on the Individual Credit Account CG-3476, but you will document the food items used for those meals on the DD-1149. This form will also be used if you disburse food items to other Armed Forces or other government agencies.

Directions: Complete each section of the 1149 worksheet as described below.

REQUISITION AND INVOICE/SHIPPING DOCUMENT							Form Approved OMB No. 0704-0246	
<small>The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0246), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</small>								
PLEASE DO NOT RETURN YOUR FORM TO THIS ADDRESS. RETURN COMPLETED FORM TO THE ADDRESS IN ITEM 2.								
1. FROM: (Include ZIP Code)			SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	8. REQUISITION NUMBER		
Your unit with zip code					Date of issue	N/A		
2. TO: (Include ZIP Code)			7. DATE MATERIAL REQUIRED			9. AUTHORITY OR PURPOSE		
FINCEN (submit with CGDFOS)						AMIO		
3. SHIP TO - MARK FOR			10. SIGNATURE			11a. VOUCHER NUMBER & DATE (YYYYMMDD)		
Blank			N/A			N/A		
4. APPROPRIATIONS DATA			12. DATE SHIPPED (YYYYMMDD)			b.		
Blank			N/A			14. BILL OF LADING NUMBER		
			13. MODE OF SHIPMENT			15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.		
			N/A			N/A		
ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CON-TAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
001	Rice, white, 20#	Bag	1		N/A		9.99	0.00
002								0.00
								0.00
								0.00
								0.00
								0.00
								0.00
								0.00
								0.00
								0.00
16. TRANSPORTATION VIA MATS OR MSTs CHARGEABLE TO				17. SPECIAL HANDLING				
ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19. CONTAINERS RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY
CHECKED BY			N/A			21. QUANTITIES RECEIVED EXCEPT AS NOTED		
PACKED BY						20. RECEIVER'S VOUCHER NO.		
	0.00		TOTAL	0.00	0.00			0.00

DD FORM 1149, APR 2000

How to Develop Job Aids, Continued

Parameters/ Constraints

The process of job-aiding often helps the developer identify potential special learning problems. If such problems do exist, you should refer to your supervisor for consultation with an ISD professional since special tactics/techniques may need to be incorporated and built into your development efforts. Examples of potential learning problems that can be identified during job aid design include:

- Several nested “If/Then” decision tables within an “If/Then” table
- Flowcharts with multiple decision blocks

Course developers can identify areas of potential special learning problems or conditions through these simple steps:

1. Design job aid
2. Developmentally test (try-out) job aid
3. Identify what’s wrong or didn’t work in job aid
4. Re-design
5. Re-test

Also, Tip Sheet, *Tip-H.5*, from Chapter 3 on target audience analysis is another tool that early on may identify where potential learning problems could exist and your design and development may reflect that.

Additional Resources

Instructional designers and course developers have many additional resources to step them through the process for developing job aids. They include:

- SABA “Job Aid for Developing Job Aids” workshop
 - CG Training System *SOP, Vol. 4: Job Aids*
 - Allison Rossett’s book: *A Handbook of Job Aids*
-

5.3 – Performance Tests

Introduction

Overview

Performance tests are activities used to assess a student's progress in the learning process against predetermined criteria. The purpose of this evaluation is to show that the trainee can successfully perform the task (process and/or product) to standard as stated in the terminal performance objective.

Coast Guard resident instruction assessments should always be criterion-referenced, meaning that the test should determine whether or not a student can meet a job-related standard regardless of the performance of the other students. For example, if a student's job requires him to file personnel documentation with 100 percent accuracy, then in order to receive a "GO" on a performance test for this requirement, a student would have to file personnel documentation to Coast Guard standards each time. Anything else would be a "NO GO."

The most obvious time for determining the evaluation criteria for a performance test is immediately after determining the conditions and standards of the terminal performance objective. Therefore, this development task is often conducted in concert with continual Design phase efforts for Determining Evaluation Criteria (*Chapter 4.3*).

Purpose

Coast Guard conducts performance testing to determine if students can accomplish the objective prior to satisfactory course completion, and presupposes that transfer of task proficiency ensuring they are ready to perform on the job.

Performance tests should focus on outcomes to be measured, and/or processes to achieve that outcome – *not* the instructional process. All Coast Guard performance tests will evaluate the quality of the output (task performance), but many will also evaluate the execution of the task procedure.

Due to all these complexities and design decisions that go into the development of performance tests, this process, which includes developing the appropriate simulations, case studies, scenarios, role plays, etc., can take a bulk of your development time, so consideration for this should be made in the project schedule section of your POAM.

Introduction, Continued

Inputs

The following information is needed before you can begin development of performance tests:

- TPOs (from Design phase, see *WS-J.1*)
 - Task analysis/task detailing (see *WS-F.1*)
 - Design, development and delivery constraints and parameters analysis (from Analysis phase)
 - Evaluation criteria selection (from Design phase, see *WS-J.2*)
-

Outputs

The outputs of this task are performance tests that validate student performance proficiency for each and every performance objective, and serve as the foundation for validity and reliability. They combine the terminal performance objective developed during the design phase and the step-level data captured during Analysis with the evaluation criteria selection from design.

Performance tests should be developed according to the template in *Appendix N*, and quality reviewed using the checklists in *Chapter 7: Evaluation/Course Assessment*.

How to Develop Performance Tests

Overview

The performance stated in the objective should be the same performance required during the test. The standard or criterion used for assessment is also listed in the terminal performance objective (TPO). This is where you'll determine if you have a poorly written TPO and need to refine the criteria or specific, observable standards.

Steps

The process for developing performance tests has been outlined in the steps below. Additionally, a job aid has been included in *Appendix M* which shows the process for developing performance tests and associated testing criteria in much greater detail, *Appendix N* provides a template for creating the checklist.

Step 1: Identify the performance in each objective.

Step 2: Draft a criterion-referenced test, specifying the performance required.

Step 3: Identify the conditions under which the performance should occur. (If they cannot be emulated, match them as closely as possible.)

Step 4: Add the standards, and any other evaluation criteria to the test (*refer to Design Phase, WS-J.2*).

Step 5: Establish the steps for successful evaluation of this task (process and/or product) (*refer to Analysis task details, WS-F.1*).

Step 6: Define the testing criteria and instructions for administering the performance tests.

Additional Resources

Additional resources for developing performance tests include:

- *Appendix P*, Tip Sheet "What Performance Tests Are and Are Not"
-

How to Develop Performance Tests, Continued

Example

An example of a performance test checklist follows (see the complete performance test package that accompanies this PTC in Appendix O):

Unit 1: OS Fundamentals

Rev 01/14/2011

PERFORMANCE TEST CHECKLIST (PTC)

Name: _____

Class #: _____

TPO 1.1						
Respond to an Electrical Shock emergency						
Student may use the following:	<input type="checkbox"/> Job Aid	<input type="checkbox"/> Reference Material	Other: _____			
EVALUATION CRITERIA:						
Accuracy:		Completeness:		Time:		
<ul style="list-style-type: none"> • Power correctly secured • Victim removed using nonconductive instrument • Victim placed in correct recovery position • No injury to self or others • Appropriate notification to command and/or supervisor 		Victim completely removed from source		Action is taken immediately		
STEP	Attempt					
	1 st		2 nd		3 rd	
	Y	N	Y	N	Y	N
Process Evaluation						
1. Secure Power	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Obtain help	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Remove victim from source	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> ✓ Victim completely removed from source with nonconductive instrument ✓ Action taken immediately ✓ No injury to self or others 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Assess condition of victim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Brief responders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Make notifications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product Evaluation						
1. Victim free of source	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> ✓ Victim completely free, in correct recovery position 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Response decisions:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> ✓ Accurate and immediate assessment of situation ✓ Accurate and immediate assessment of victim condition ✓ Correct decision – safe to assist without causing harm to self or others 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Reports:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> ✓ Accurate and timely reports to command and/or supervisor 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional notes for successful testing:	<input type="checkbox"/> Go <input type="checkbox"/> No Go		<input type="checkbox"/> Go <input type="checkbox"/> No Go		<input type="checkbox"/> Go <input type="checkbox"/> No Go	
Enter testing Scenario used						
Evaluator's Dated Initials:						
Course/School Chief dated Initials (required with 3 rd attempt only)						

End of PT Checklist. To record Student progress, go to the Assessment Record on the following page.

5.4 – Remediation Plans

Introduction

Overview

Remediation, or a lack of learning transfer, is the instruction given to students by an instructor or administrator to raise a student's competency in performance of a particular task(s). These are the specific directions/plans you set in place to assist the instructors when they have identified an apparent gap in learning transfer.

The need for remedial instruction will be most prevalent once the student's begin their performance tests, and instructors identify problems in the initial attempts. The feedback and guidance provided by the instructor when these performance deficiencies are identified are critical to the student's future performance and continuation in the course.

Purpose

The purpose of establishing a remediation plan in advance is to remove the guess-work from the instructors and outline recommended next steps they can take when assisting a student who is having difficulty during practices or has received a *NO GO* in initial attempts on their performance test. This can include general guidance, reference to additional practice exercises, or alternate delivery approach that may be more suitable for that student's particular learning style.

Remediation plans are most valuable when a course developer has identified potential learning problems, and an ISD professional was consulted for recommendation on how to address these special learning tactics (see section 5.2 – *Job Aids*) during development efforts; as these are tasks the students are most likely to struggle with, so providing remediation plans during your development efforts is invaluable in supporting these tasks.

Introduction, Continued

Inputs

The following information is needed before you can begin development of remediation plans:

- Performance tests
 - Target audience profile/analysis (regarding learning preferences)
-

Outputs

Remediation plans can have many possible solutions, all of which will direct the instructors to the right source for further guidance. For example, they may include:

- Redirection of the student back to text already covered in order to receive supporting context needed to perform a particular exercise or learning activity
 - Additional practice exercises
 - Review of standards for particular task to ensure expectations for performance are clear
 - Referring instructor to consideration of student's preferences in learning styles, and assistance to the instructor on alternate methods for delivering information during remediation to meet the student's needs
-

Guidance to Develop Remediation Plans

Process There is no specific process for development of remediation plans, as each course may differ depending on task complexity. Therefore, we provide guidance and reference to specific “inputs” from which course developers should refer to in order to develop remediation plans. There are many possibilities for remediation, and it is important to include some of these options for the instructor to refer to.

Example An example of a remediation plan that accompanied an Operations Specialist (OS) task follows:

REMEDICATION FOR TPO 2.1

HOW TO CONFIGURE COMMUNICATION CIRCUITS

*Guidance for Remediation is below, and applies for each item checked **NO** during the assessment:*

Step	Action
1	Explain “not yet capable” assessment decision to the Student
2	Contrast Student performance with the required standard
3	Reinforce what the Student did well
4	Refer the Student to the relevant reference or procedure
5	Tell the Student what s/he must do to demonstrate “fully capable” performance
6	Document assessment decision
7	Obtain Student acknowledgement of assessment decision
8	Sign and date the Performance Test Checklist (feedback page).
9	Arrange for extra practice, study, or coaching as required
10	When remediation is completed, schedule the next Performance Test
11	Repeat the process until the Student either demonstrates “fully capable” performance OR requires referral for further assessment
NOTE	IF remediation OR referral is required, THEN the school chief OR designated deputy MUST certify any subsequent assessment decision

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5.5 – Demonstrations

Introduction

Overview

With job aids and performance tests completed, it is time to develop activities aligned with the instructional strategies and instructional methods specified in the design phase and which will be executed in the lesson plan. The next three sections of this chapter will address in more detail each of the following learning activities:

- Demonstrations (5.5)
- Practice (5.6)
- Content development (i.e. presentations, 5.7)

Demonstrations are activities designed to communicate concepts or skills from the instructor to the student. At this point the instructor introduces new information and guides the student through the “how to” of that task/objective.

Purpose

Incorporating demonstrations into the learning process is just one of several instructional strategies course developers can employ. The goal is to determine what strategies will result in optimum conditions for cost-effective and efficient instruction. Decisions on instructional strategies are often determined in the Design phase, but the Development phase is a good time to revisit these decisions as the course developer pulls the activities for successful instruction together.

Demonstration and practice are two of the ways that students are actively engaged in the learning process. Since people most often learn by doing, involving them as soon as possible in the hands-on aspect of a particular task is essential; thus, demonstration – more so than content delivery via presentation – is an important strategy.

Introduction, Continued

Inputs

The following information is needed before you can begin development of demonstrations:

- Job aids
 - Performance tests
 - Instructional strategy and instructional media selection (design decisions)
-

Outputs

Demonstrations developed to facilitate the content delivery in a more interactive manner that prepares the student to begin the practice exercises.

Demonstrations should be developed according to the Demonstration section of “Checklist: Instructor Guides” in *Chapter 7: Evaluation/Course Assessment*.

Guidance to Develop a Demonstration

Overview

Learning guidance for objectives that involve the application of rules, regulations, or classifications should include a range of examples to show how the core information is applied in various situations. Demonstrations are best used for procedural objectives. The demonstration serves as a concrete example of how a procedure should be performed according to Coast Guard standards. Before demonstrating the procedure, describe the conditions under which the operation or procedure is performed, to include the tools, equipment, and job aids required. During the demonstration, explain difficult steps, common errors, and decision steps. Provide only essential information during the portrayal.

Process

When providing examples or a demonstration, consider the following:

- Cover a range of situations that students are likely to experience
 - Call attention to common on-the-job errors or difficult situations
 - Present a step-by-step application of the performance objective indicating and labeling each step clearly
 - For calculations or computations, clearly present each logical step in the formula
 - Ensure that examples presented are consistent with essential information, practice, and test items
 - For classification-type objectives, present examples and non-examples
-

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5.6 – Practice Exercises

Introduction

Overview

Most often before your practices, your design decisions included a prior demonstration of the task the student will now be attempting to complete. Practices are often developed in a manner to build upon previous knowledge and skills to ultimately have the student performing to a level of simulation as close as possible to that expected of them on the job. This may include initial practices that introduce at a basic level at low simulation, and progressive practices with more complex scenarios at higher level of simulation to prepare students for the conditions under which they have to perform this task when tested. Practices are a key component to learning transfer.

Purpose

Before developing any student materials, instructor guides, and instructional media designers need to know what it will take to provide appropriate amount of practice, and to which level those practices will occur given the conditions of the task. In general, when development is complete, the performance identified in the objective, the (final) practice exercise, and the test should result in the student performing the same behavior. Therefore, the purpose of practice is to ensure the student is competent and confident in the task expected of them, and they are ready for the performance test.

Application

Every performance objective will have at least one series of practice exercises that the student will complete before being asked to show proficiency on the performance test. The amount of practice necessary will depend on the following factors (obtained from *Task Details: WS-F.1*):

- Complexity of the task
 - Previous experience and pre-requisite skills student brings to this performance
 - Various situations, inputs, or stimuli that can provide the multiple scenarios that can initiate the task, or decisions that result in different outputs of the task
-

Introduction, Continued

Inputs

The following information is needed before you can begin development of practice exercises:

- Lesson design plan (from Design phase, see *WS-J.3.C*)
 - Performance tests
 - Job aids
 - Demonstrations
 - Task analysis/task detailing worksheet (see *WS-F.1*)
-

Outputs

Practices are:

- Exercises or activities intended to reinforce and consolidate recently acquired concepts or skills
- Activities that represent a directed or guided process in which the trainee manipulates the concept or practices the skill
- Cyclical exercises that tie in a feedback mechanism for the instructor when observing students practice

Practices result in the internalization of the concept or skill so that it now “belongs to” the trainee.

How to Develop a Practice Exercise

Guidelines for Practice Activities

Guidelines for developing practice activities include:

- Present practice items in instructor-led or self-assessment format. If the latter format is used, make sure there is some provision for performance feedback in the practice activity.
 - Provide enough practice. Students should have opportunities to apply rules, regulations, or classifications in situations that represent what students are likely to experience in the workplace. Consistent with student management requirements, make sure that even the slowest student is afforded adequate opportunities for practice.
 - Practice activities and scenarios should be sequenced in order of the challenge - from relatively easy to more difficult conditions.
 - Provide opportunities to make common errors. Give feedback immediately after practice to show students what is wrong and how to correct it. Also give feedback to reinforce the correct performance, recognize worthy effort, and encourage continued effort toward mastering the performance objective.
 - Practice should facilitate task progression. Practice events should be consistent with the performance objective, examples, demonstration, and performance test. Final practice conditions should be nearly identical to those of the performance test. Present the final practice activity in the same form as the performance test. Provide only the cues, direction, and support that the student would have under actual performance conditions.
-

How to Develop a Practice Exercise, Continued

Feedback Strategies

Students need feedback to know how well they are progressing toward proficiency of the objectives so they can use that information to improve their performance. Practices should include provisions for feedback to each student. Such feedback may be in the form of questions to confirm comprehension or clarify misunderstandings, observations regarding capable performance, or redirection when performance does not meet the required standard.

Guidelines for Feedback

To improve their performance, students require relevant and helpful feedback. Without feedback, students will not know what they are doing well or what they need to improve. Practice feedback reinforces capable performance and redirects progress toward proficiency of the performance objective. Feedback, by the instructor, can also direct students to the appropriate learning materials or performance support resources for extra study.

Guidelines to be provided to the instructor in their use of feedback include:

- Provide feedback immediately after practice. Demonstrate the correct performance. Explain how to perform the task correctly.
 - For practice involving procedures or operations, feedback should progress in a logical, step-by-step sequence.
 - Identify and explain common errors in terms of standards and consequences of non-performance.
 - Reinforce capable performance or worthy effort.
 - Ensure the student understands what he or she must do to meet the required performance standard.
-

How to Develop a Practice Exercise, Continued

Process

In deciding *what* to practice, use the worksheet (WS-N.2) provided in *Appendix N* and the job aid *JA-M.3* to capture the information described in this process:

Step 1: Write out what the participant would be *doing* when practicing the performance in the objective.

Step 2: Write down what additional items are needed in order to make the practice happen. These items are usually the conditions (tools, equipment, etc.) required in the performance of the skill.

Step 3: Write down how the feedback to the performance will be given. Feedback should be adequate, diagnostic, corrective, and focused on the performance.

Step 4: Identify the highest level of simulation (that which mirrors the conditions expected during the performance test)

Step 5: Determine to what level of simulation this practice will occur in relation to desired level expected during performance test (*it's helpful to note which level of many, if such is the case*).

Step 6: Draft your practice exercise scenario and directions.

Step 7: Repeat the above steps as necessary to cover the various levels of simulation in progressive practice exercises (if applicable) until the final practice mirrors the level expected in the performance test.

How to Develop a Practice Exercise, Continued

Example

Following is an example of a practice exercise developed using the worksheet:

WS-N.2 Practice Exercises Worksheet	
Project	YN A Course
Designer	YNC Moniz / G. Smith
Performance	<p>Given direction by a supervisor or a member request, PREPARE a business letter without error, using the USCG Correspondence Manual COMDTINST M5216.4C (series) and applying all relevant customer service standards.</p> <p style="text-align: right;">Date 06 June 2010</p>
Tools and Materials <i>All materials required by the conditions</i> <i>Any materials needed specifically for the practice</i>	Feedback
<ul style="list-style-type: none"> • USCG Standard Writing Template (SWT/MACRO) for letters • Coast Guard Correspondence Manual, COMDTINST M5216.4C • Standard Subject Identification Codes (SSIC) Manual, COMDTINST M521.5 (series) • Standard Distribution List (SDL) website: http://www.uscg.mil/hq/cg1/psc/library.as • Originators information and files related to correspondence • Standard Work Station • Printer 	<p>Provide feedback as necessary throughout practice exercise, to provide any clarification or guidance.</p> <p>Explain to student why output (business letter) was not to standard, and how to improve during next attempt.</p>
Highest level of simulation (tested to on PT)	Level of simulation in practice (any changed conditions, etc)
Student will create an actual business letter given a scenario, references and job aids (SWT for letters, SSIC, SDL, and Correspondence Manual).	Students will create actual business letters during the practice session. There is no difference in the levels of simulation between the test and practices.
Scenario / Additional Criteria	<p>You are the yeoman at Training Center Petaluma and working for Captain Christopher J. Hall, and he wants to invite professional golfer Arnold Palmer to be the graduation speaker for the one-thousandth graduating class of Yeoman "A" School. Mr. Palmers address is: 101 Golf Course Way, Golf Town, PA 18034.</p> <p>Date the letter 1 July of the current year for Captain Hall's signature.</p> <p>As a former graduate of Yeoman "A" School, I would like to extend an invitation to you to be the guest speaker at the one-thousandth graduation ceremony for Yeoman "A" Class 01-CY, which will graduate on November 10, 20CY.</p> <p>In preparation of this historic event, I have designated Master Chief Wolfe, School Chief Yeoman "a School as your point of contact. You can reach him at 707-765-7105 or by email at Richard.S.Wolfe@uscg.mil.</p> <p>Please contact me at the above number if you have any additional questions.</p> <p>End of Scenario</p>

5.7 – Content Development

Introduction

Overview

An important step before development of any instructor guide and course-related instructional materials to support delivery of the instruction is to determine what content is needed to assist in the learning process. Content derivation bridges the gap between what the students already know and what they need to know, or do, before being able to practice the objective

Content development fills in the blanks between your Introduction and demonstrations/practices. This may require minimal actual development if it's determined there are sufficient commercial-off-the-shelf products. This is necessary for course developers before you:

- Developing instructional media
 - Developing student materials
 - Compiling instructor guides
-

Purpose

This section helps you determine what content is necessary to support the student's successful performance of particular task. This will also help determine if you can locate and repurpose existing content, or need to develop an in-house student guide that contains that supporting content.

The decisions in this process are two-fold:

- What content needs to be delivered before the practice begins?
- How will that content be delivered (if not already determined in the Design phase- which may be evaluation of available Commercial Off-The-Shelf (COTS) products)?

For more detailed information, see the next chapter 5.8: *Instructional Media*.

Introduction, Continued

Inputs

The following information is needed before you can begin development of content:

- TPOs
 - Performance tests
 - Practice exercises
 - Demonstrations
 - Design, development and delivery constraints and parameters analysis (from Analysis phase)
 - Target population (from Analysis phase, see *WS-F.2*)
-

Outputs

The outputs of this task consist of the determination of what content will be contained within the course-related instructional materials to support delivery of each lesson. See chapter 5.8: *Instructional Media*, which further discusses the media/methods of how this content will be delivered and whether development is necessary. Content may be conveyed to the students in one or any combination of the following methods:

- Video or in-person demonstrations
 - PowerPoint presentations
 - Textbooks providing knowledge content
 - Homework exercises that have students review textbooks or references for content they'll have to apply in a lesson
-

Guidelines for How to Develop Content

Content Analysis

Content analysis is the process of systematically reviewing written documentation and collecting, analyzing, and interpreting critical information about specific skills, techniques, or behavior patterns that may or may not be related to a particular job or task, but that have been identified as contributing to overall successful performance.

Content is rarely generated from scratch. Almost every topic already has existing content in other forms (such as textbooks, technical manuals, references, and other courses). An assessment on what you need, and then the most efficient and effective method of delivering and providing that content to the students are the decisions made during content analysis.

Steps

The following steps will assist in determining required content versus ancillary information; also see job aid *JA-M.2: How to Determine Necessary Content*. Additionally, you may use *WS-N.3* to capture your decisions.

Step 1: Review the objective.

Step 2: Review the test and relevant practice description.

Step 3: Review the skill hierarchy and target population description, noting what the students can already do.

Step 4: List the reasons why the students cannot immediately begin practicing the objective.

Step 5: Determine if content listed is considered *Need to Know* or *Nice to Know*.

Step 6: Identify the source for delivery of content

Step 7: Identify content already available through repurposing commercial off-the-shelf (COTS) products (i.e. existing textbooks, online support, tech manuals, etc).

Step 8: Determine the delivery system by selecting a delivery system that is economical and provide features that allow you to meet the objective.

Additional Resources

Appendix P contains a tip sheet for assisting in content decisions: *Too much versus Not enough*.

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5.8 – Instructional Media

Introduction

Overview

Instructional media encompasses a wide range of materials that are developed to support the delivery of the instruction. In the Design phase, you selected an instructional strategy (*Lesson Design WS-J.3.C* page 1) to help determine the most appropriate delivery method for the content, audience, and environment, and then went on to select the instruction media for the various lesson activities (*Lesson Design WS_J.3.C, page 2*). The various benefits and drawbacks to the different types of instructional media were presented in Chapter 4 to aid in your selection process. Some of the types of media include visuals or other training aids.

Visuals:

- Overhead transparencies
- PowerPoint presentations
- Turn charts and wall graphs
- Videos

Other Training Aids:

- Handouts
- Models and replicas
- Interactive media/computer-based training (CBT)/E-learning

Purpose

Instructional media are the means used to present information to students. To ensure that the content of the course is presented to the students in a cost-efficient and effective way, select instructional media that are appropriate to the training situation and feasible under existing resource and logistical constraints.

In this SOP, guidance is provided on the selection of instructional methods and media as individual tasks. Selection of feasible and appropriate methods of instruction is important. In some cases, it may be efficient to consider methods and media together. In other cases, such as consideration of complex interactive multimedia instruction and e-learning solutions, it may be more practical to select media as a discrete task.

Introduction, Continued

Inputs

The following information is needed before you can begin development of instructional media:

- Design worksheet (see *WS-J.3.C* showing media selection)
 - Content development
 - Target population (from Analysis phase, see *WS-F.2*)
 - Design, development and delivery constraints and parameters analysis (from Analysis phase)
-

Outputs

The outputs of this task are developed based on the decisions detailed in the *Lesson Design Worksheet WS-J.3.C*. This often includes a PowerPoint presentation.

Example

The following is an example of a PowerPoint where the course developer utilized the “notes page” feature in the application. It is recommended that the presentation be developed with the teaching points you would like the instructor to make included in the notes block that accompanies each slide, rather than the duplication of the slide and notes included in the Instructor Guide. This “notes page” feature should be printed and referenced in the Instructor Guide when discussing delivery of this media. This reduces the need to make content changes in more than one location when an update is necessary.

IG • EXCOMM Maintain RS-2900

205.1. Perform a Functional Test

- Please locate **RS-2900 Functional Test** in Job Aids
- Instructor demonstration
- Student Practice
- Ask questions whenever needed

Machon 3.3-2900
ET • OMER School

Please do the following when showing this slide:

1. Ensure that the students locate “**RS-2900 Functional Test**” using Table of Contents in Job Aids before your demonstration.
2. Remind the students to take notes as needed and encourage them to ask questions during and after the demonstration.
3. Allow students adequate time to practice this task.
4. Discuss all the issues that the students have for this task.
5. Use the space in your IG to take notes on Q&A.

Guidelines for How to Select and Develop Instructional Media

Selection Guidelines

When selecting media, ensure that the modes selected:

- Effectively support the specified instructional strategy
- Are efficient in terms of development time, money, and resources
- Do not conflict with the specific training environment
- Are relevant to the performance objectives
- Are pitched to the appropriate type and level of learning
- Permit individualization of instruction, as appropriate
- Include the appropriate copyright permissions for usage

Types of Media

Instructional media may be classified by the instructional strategy, or mode of delivery. Delivery modes include classroom instructor, print materials, audiovisual devices, interactive multimedia, and training devices.

Of all the above Instructional Strategies, throughout course development efforts for Resident Instruction, you'll primarily be concerned with LL (leader-led) instruction. This table³ shows the recommended media for LL instruction:

Media Format	Instructional Strategy					
	SI	LL	SDL	CBT	WBT	OJT
Chart		✓			✓	
Whiteboard		✓			✓	
Chalkboard		✓			✓	
Overhead		✓			✓	
Computer Projector		✓			✓	
Slides	✓	✓	✓	✓	✓	✓
Slides with Audio	✓	✓	✓	✓	✓	✓
Audio Tape	✓	✓	✓	✓	✓	✓
Video	✓		✓	✓	✓	✓
Wall Chart	✓		✓	✓	✓	✓
Model/Mock-up		✓				✓
On-line Document	✓	✓	✓	✓	✓	✓
Print	✓	✓	✓	✓	✓	✓

³ Source: "Designing Instruction: Support Manual" by Friesen, Kay and Associates, 1998.

Guidelines for How to Select and Develop Instructional Media, Continued

Advantages and Disadvantages

The following are some advantages and disadvantages to various types of media. If no specific type of media is provided as an input from the Design phase, you may want to go back and have further discussion if these decisions still need to be made for types of Instructional Media to be developed. Additional limitations and advantages based on your delivery method are provided for consideration in *Appendix P, Tip_P.3*.

Media	Advantages	Drawbacks
Overheads	<ul style="list-style-type: none"> Convey clean professional text and graphics when prepared ahead Can be created with participant input Visible to a large audience 	<ul style="list-style-type: none"> Overhead project and screen required Not suitable for images required to be visible for long periods of time (fan noise and eye strain) Limit presenter movement Cumbersome to change slides
Computer Projectors	<ul style="list-style-type: none"> Can incorporate animation Can incorporate building slides Can synchronize easily with verbal presentation Convey professionalism Presenter can move around the room 	<ul style="list-style-type: none"> Dim room lighting reduces learner participation Order of slides not easily changed during presentation May be misused to focus on the visual presentation rather than as an aid to learning
Flipcharts	<ul style="list-style-type: none"> Invite learner participation Created with learners Build ideas Extemporaneous, spontaneous Can be posted or referred to later 	<ul style="list-style-type: none"> Size of page Waste paper Instructor skill Suitable for smaller groups only (less than 25)
Whiteboards	<ul style="list-style-type: none"> Create with learners Large size Easily removed or changed 	<ul style="list-style-type: none"> Presenter must face the board while creating Instructor skill
Wall charts	<ul style="list-style-type: none"> Professional, clean image to post Suitable to convey ideas or information that will be referred to throughout the presentation 	<ul style="list-style-type: none"> Cumbersome to carry to location Size Static image

5.9 – Student Materials

Introduction

Overview

Student materials present all the information necessary to support specific instructional objectives. The course developer determines the format and inclusiveness of information within a *student guide* depending on numerous factors, including the results of the Content Analysis and availability of commercial off-the-shelf (COTS) products (e.g. textbooks) that are purchased to replace or supplement the student materials being developed. Essentially, student materials are developed and written to be used in one of two manners:

- As a *teaching device* - either the central or the only source of instruction available to the student (comprehensive student guide)
- As a *teaching aid* - one of many media used to convey the instructional design (i.e. student syllabus, homework workbook, condensed student guide)

Student materials should replicate the actual work environment as much as possible. So, if a student will need to use a technical manual, recipe book or lab guide once on the job, you shouldn't present that information in a self-created student guide for training purposes. The student should learn how to use the tools they need to be successful upon graduation, so ensure the students have this in the classroom and make the student guide useful for information they don't have via other media.

Purpose

When developing student materials, the primary objective is always to transmit a specific message effectively to your target audience. The difficulty comes in determining which information should be:

- Included in the text
- Included in other media (if any)
- Discarded altogether (“nice-to-know”, not “need-to-know”)

The style of your writing, the amount of detail that you include, and the format of your student guide/materials will all vary depending on whether the materials are to be used as a teaching device or a teaching aid.

Introduction, Continued

Inputs

The following information is needed before you can begin development of student materials:

- Content development
- Design, development and delivery constraints and parameters analysis (from Analysis phase)
- All other instructional materials
- Any references or materials not developed in-house (i.e. COTS products)

Output

The output of this task is student materials that enhance and fill in gaps necessary to assist in the learning process.

Guidelines for Developing Student Materials

Development Factors

If developing a Student Guide, it should *not* be “cut-and-paste” content from textbooks or technical manuals that the students are already using in class. Rather, they should contain any other content information that will help bridge the gap in learning from prerequisites to new skills. Key factors in doing this are to:

- Determine the need
 - Determine what supplemental information must be provided to students that isn’t in other resources they will be using or have available to them throughout the course
-

Determination of Purpose

Student materials can be developed to serve one of the following purposes:

- As a *full lesson-by-lesson student guide* providing student information needed throughout the instruction
- As a *homework/workbook supplement* when another media is the primary source of information for the student and the student guide is being developed to provide supplemental information and a central location for assignments and exercises that follow the instruction
- As a *syllabus guide* that really does nothing more than direct the student to appropriate locations in other media to complete and follow the instruction

When determining the purpose, be sure to refer to information from *Chapter 3, Design and Delivery Constraints, WS-F.3* for decisions on what is the best approach (if any) for development of student materials.

Guidelines for Developing Student Materials, Continued

Style, Packaging

No matter what the purpose of your student materials or the type you decide to develop for your particular project, every framework *must be based on sequenced instructional objectives*. The student materials will follow the sequencing choices previously made (as shown in the course map and your instructor guide). The *body* of your student text will vary according to the subject matter, type, and purpose.

Additionally, when determining how to package your student materials, you should look at the size of your overall document and purpose. If you are developing a student guide for a larger project, it is more likely that you will need to break up your student guide into units throughout the course; whereas, if the project is smaller in scope, your student materials may be bound as one simple workbook or document.

5.10 – Instructor Guides

Introduction

Overview

Instructor guides (IG) serve as a:

- Preparation aid *before* training begins
- Job aid during training
- Standard to ensure that training is delivered as designed

The IG is *not* a lesson plan. The IG is the *packaging* of the instructional materials of which the lesson plan is one element. The designer will make a decision on how the IG is compiled such that it may be:

- By course (i.e. one IG with 26 lessons for the course), or
- By unit (i.e. six IGs for the six units of the course, each with the appropriate lessons for that unit), or
- One IG per task (TPO)

Each lesson plan within the IG is developed as a job aid on how to facilitate the learning and skill check (performance test) for that particular task, performance, or TPO.

Note: *If your course or lesson is primarily knowledge-based delivery of content (i.e. no demonstration, practice and performance-based testing), then consult an ISD professional on how best to proceed. These are often opportunities to consider a blended learning approach or alternate distance learning (ADL) solution.*

For the instructors that will be using this material to deliver their courses, the IG needs to be organized in a manner that makes sense and is usable, since the instructor guide ensures the course and each particular lesson is delivered in the same way with the same results every time.

Introduction, Continued

Purpose

The purpose of an instructor guide is to provide detailed guidance to the instructor on how to most efficiently deliver information to students which results in effective transfer of skills and knowledge. Instructors will have more confidence when they get up in front of a class and have a detailed instructor guide that they reference help them get the students from “novice” to “master” of those particular skills

A well-planned guide ensures that the IG content mirrors the content of the course and includes the instructional strategies necessary to deliver the course material. A well-organized instructor guide presents the information in a logical sequence and a predetermined order of contents. It is a written document that is used in conjunction with other course materials, outlining what to teach and how to teach it. It should *not*, however, be an exact replication of the content that is in the student guide, PowerPoint or other student references. It should instead refer the instructor to those materials when appropriate to help them facilitate the instruction.

Value Added

Using standardized instructional materials helps ensure that:

- Coast Guard training is as standardized as possible so that all students receive the same quality of training
- Training events allow students to learn, retain, and transfer job information and skills
- Each delivery of the lesson proceeds in consistent direction, covering all material that is required to meet objectives for each student

For these reasons, course developers shall consider instructor guides in every course development effort.

Introduction, Continued

Inputs

The following information is needed before you can begin development of instructor guides:

- Course map (sequencing of instruction)
 - TPOs
 - Performance tests
 - Job aids
 - Practices
 - Demonstrations
 - Instructional media
 - Remediation plan
 - Design, development and delivery constraints and parameters analysis (from Analysis phase)
-

Outputs

The outputs of this task include a comprehensive instructor guide that can be used in concert with student materials, lesson plans, and all deliverables required for instruction.

The instructor guide template can be downloaded for use from: <http://www.uscg.mil/hq/cg1/TracenPetaluma/SOP/Templates.asp>. Additionally, you should use the checklist in *Chapter 7: Evaluation/Course Assessment* to review quality.

Parameters and Constraints

Many instructors like the idea of having leeway in what and how they teach. However, as a course developer, comprehensive lesson plans ensure that the outputs follow sequencing structure and flow as determined in the Design phase. Course developers should advise instructors that their input is welcome, and when they feel changes or revisions are needed, they should follow the procedures outlined in *Chapter 8: Course Maintenance*. This protects the instructional integrity of the product, ensuring a systematic ISD process is followed.

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Guidelines for Developing Instructor Guides

Preparation of the Instructor Guide

Instructor guides are one of the final development efforts you should be doing, because it becomes the “packaging” – or preparation – of all the other elements you developed in this chapter. No matter how you decide to design the layout or packaging of instructor guides, they will all contain the same basic elements that are outlined in this SOP. So, although the body of the instructor guide will vary according to the subject matter, delivery media, and preferences of your customer; there is some information that shall be common to all instructor guides:

- Cover page
- About this Course, including:
 - Source
 - Instructional Settings
 - Class Size
 - Location
 - Course Length
 - Security Classification
- Table of Contents
- Course Overview, including:
 - Course Contents (units)
 - Performance Evaluations
 - Safety
 - Situational Awareness
 - Course Map

The IG is then separated by units (and then lessons within each unit). If your course design does not include separation at the unit level, you can delete that section and start next with Lesson 1.

- Unit Overview (describing lessons within that unit, and unit map)
- Lesson(s)

Several lesson plans may be packaged together within a single IG, or your packaging may be one IG per lesson plan. These are decisions that the course developer will make depending on the course and complexity of the materials. Once these packaging decisions are made, you would edit the IG template provided to include those sections you require and develop from there.

Guideline for Developing Instructor Guides, Continued

Lesson Plan

The lesson plan is based on the course design blueprint or course map produced during the Design phase. It provides the specific direction to the instructor on how to guide instruction on each particular performance objective. What is included in a lesson plan was established in the Design phase as well as the structure and sequence of instruction. Since all elements of your lesson plan should already be developed, the lesson plan is the packaging which brings all the elements together for the instructor on each objective.

Elements of a Lesson Plan

The key components for a performance-based lesson consist of the following elements:

- Introduction
 - Gaining Attention
 - Tell students what objective(s) are
 - Recall prerequisite learning
 - Content Delivery
 - Demonstration and Examples
 - Practice Activities and Feedback
 - Assessment
 - Summary and Review
 - Include any follow-through activities
 - Provide students with job aids or memory aids for retention
 - Allow instructors to provide students with last-minute considerations about newly learned tasks when they return to the field
-

Guidelines for Developing Instructor Guides, Continued

Examples

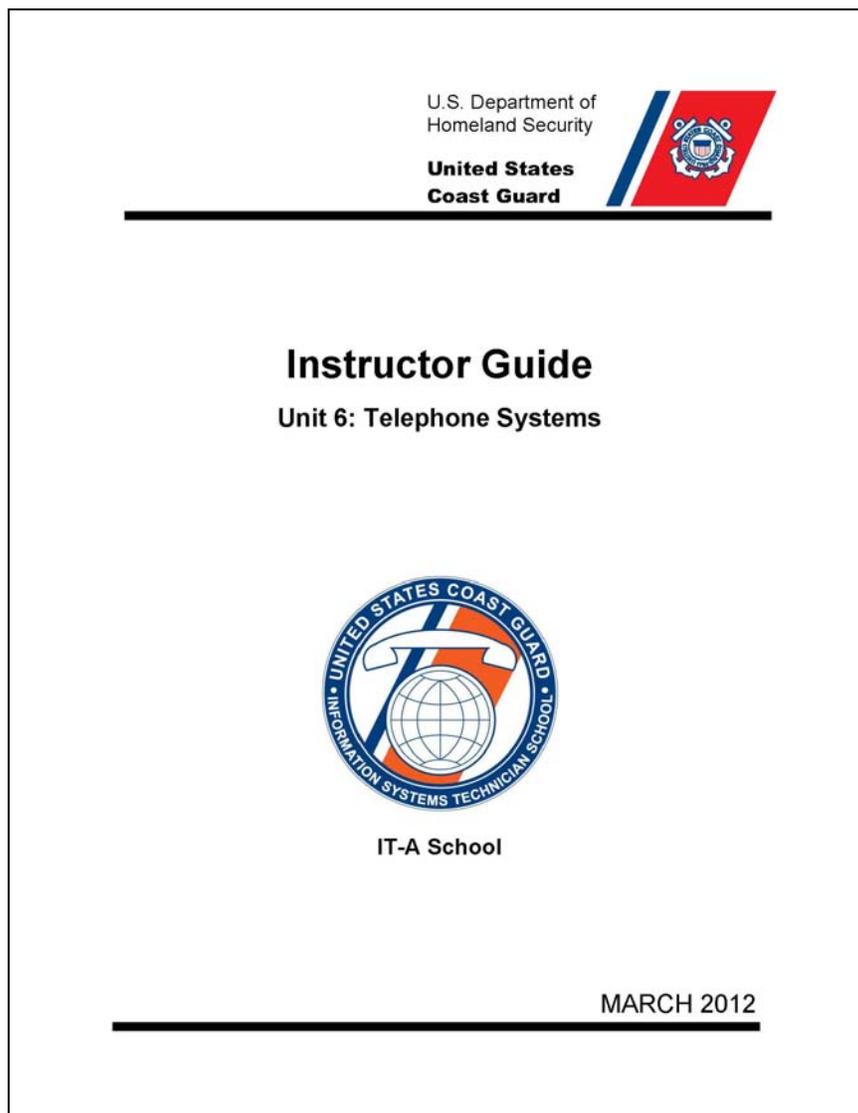
The template for developing instructor guides is provided as a framework for compiling all your lessons. You can view the various “interpretations” of this template from the example instructor guide(s) located under *Appendix O* on one of the below websites.

Tracen Internet Webpage:

<http://www.uscg.mil/hq/cg1/TracenPetaluma/SOP/SOP.asp>

Tracen Intranet Webpage:

http://cgweb.tcpet.uscg.mil/T_Div/CDT/SOP.asp



Guidelines for Developing Instructor Guides, Continued

Development Factors

An Instructor Guide should *not* be an exact replication of the student guide, textbooks, or technical manuals that the students are using in class. However, it should make reference to those documents as appropriate to highlight content or information that must be delivered by the instructor in order to help bridge the gap in learning from prerequisites to new skills.

Additionally, an Instructor Guide should not consist of long paragraph(s) or text for the instructor to deliver verbatim as script. Rather, they should be constructed using teaching points (i.e. bullets) that highlight the areas of emphasis in the delivery of the lesson. If reference to such content is necessary, notes or references should be provided for the instructor to that source.

Lastly, it's recommended when using instructional media (i.e. PowerPoint), to *not* include slide screen shots into the IG. As shown in *Appendix O (EX-O.5)* – reference the PowerPoint in your IG and utilize the PowerPoint with “notes page” feature. Doing so reduces errors and the level of effort for updating material.

Style and Format

It is assumed that each training center has developed its own style guide for detailed guidance on how instructional materials should look for local course development efforts. Customized Word templates or traditional paragraph-style text using the structured writing templates (SWT) are two typical scenarios employing best practices. The provided *IG Template-2012.dot* reflects a basic style and format including:

- Text grouped into blocks of similar information
 - Blocks sequenced in an order that facilitates instruction
 - Determination of required content made (excluding “nice to know” content)
 - Map headers reflect the activity to be seen on that page (content, demonstration, practice, etc)
-

5.11 – Evaluation of Instructional Materials

Introduction

Overview

You are at this stage when instructional materials in support of each unit/course are in the process of being drafted or have already been drafted. You want to know how well they work and what to do to improve them, if needed. Developmental testing helps to recognize areas that require remediation procedures, and helps instructional staff and learners confirm that learning takes place as intended.

Unless you've got a license in mind reading, the process of "trying-out" the material is the touchstone to instructional success. There are two kinds of try-out⁴:

- The first (the focus of this chapter) is a check of an individual element (job aid, performance test, activity), that then expands to a lesson or full unit where all, or most, of the associated instructional elements are "tried out" together (looking at flow, timing, process, etc). This process involves trying it out on one person (or small-group) at a time, until all the major kinks have been removed. (this is what we refer to as developmental testing and beta testing)
- The second is a try-out of the entire course (that is the pilot, or validation, discussed in Chapter 6).

As depicted in the CG ISD model, evaluation is ongoing throughout your course development efforts; herein we will further discuss the following evaluation processes:

- Technical accuracy verification
- Quality assurance ISD review
- Validation of instructional materials through one or all of the following processes:
 - Developmental testing
 - Beta testing
 - Pilot testing (*Chapter 6*)

The developmental testing process (to include technical accuracy verification and quality assurance instructional design review) can be ongoing, as each deliverable is developed it can be reviewed and tested.

⁴ Mager, Robert, Making Instruction Work, 2nd Edition, CEP Press: Atlanta, GA, 1997.

Introduction, Continued

Purpose At this point in the development process, performance objectives have been developed, tests prepared, instructional methods/media selected, and instructional materials have been developed. Yet there is no assurance that instruction will be effective. For this reason, the various elements of instruction are tested to assess the extent to which they meet product standards and are likely to support professional, student-centered instruction. If deficiencies are found in the various components of the instructional materials, they are corrected before the course is ready for the pilot test in the next phase *Implementation: Chapter 6*.

Inputs The following information is needed before you can carry out the evaluation of instructional materials:

- TPOs
- Job aids
- Performance tests
- Instruction methods determined
- Instructional media
- Instructional materials (student guide, instructor guide, etc)

Essentially, you need the instructional materials that you wish to evaluate!

Outputs The outputs of this process include:

- Technically accurate instructional materials (output)
- All materials developmentally tested (tried out)
- Materials produced using industry standard instructional design practices
- Completed, materials review worksheet (*WS-N.4*) for each lesson

Introduction, Continued

Project Schedule considerations

As with all stages of the project, be sure to manage the project timeline. Often times developmental testing is overlooked and not taken into consideration in the project schedule, impacting deadlines. Be sure to account for this in your schedule, as well as provide expected turn-around times to the AP/SMS and QA reviewers for completing each part of the evaluation process.

Additional Resources

The following additional resources are available

- Chapter 7: Evaluation
 - *Appendix M: How to Review Course Materials* job aid and *Appendix N, Course Materials Review Worksheet (WS-N.4)*.
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Part 1: Verify Technical Accuracy

Overview

Materials may be well-developed, but if they are not technically accurate for the intended audience, learning may not take place or can result in wrong skills/knowledge; distracting from the learning process. Verifying the technical accuracy is the first step in the process for reviewing materials. The Accomplished Performer (AP), Subject Matter Specialist (SMS) and/or Schoolhouse reviews the materials that are developed to ensure they are:

- Technically accurate for rate-specific content
- Usable for the instructor

The expectation of the AP/SMS conducting this review is to provide:

- Open, honest, and relevant observations regarding the technical accuracy and quality of each element of the course
- Helpful recommendations for improving the usefulness, relevance, or value for future users

It's always helpful to have your designated SMS review the material to make sure there are no technical errors. For technical materials, this is often helpful before you have a peer try-out your elements/units or lessons, but if not you would have this done after the peer try-out to ensure there were not any major technical errors.

Steps

The process described below assumes you have all necessary course material that has not yet received a technical accuracy review:

Step 1: Identify the AP or SMS that will be conducting this review.

Step 2: Provide the AP, SME, or Schoolhouse representative conducting the review with the *How to Review Course Materials* job aid located in *Appendix M*, and Worksheet (WS-N.4). This job aid and worksheet is intended to help walk the reviewer through the process and capture the data valuable to the course developer.

Step 3: Have reviewer submit recommendations back to course developer

Step 4: Make changes as necessary.

Note: Follow local processes for the routing and review of course materials through AP, QA review and onto approval for pilot test.

Part 2: Perform Quality Assurance ISD Review

Overview

Materials should then be reviewed to ensure they were developed to the instructional systems design (ISD) standards outlined throughout this SOP.

Steps

A series of checklists has been developed for use during the quality assurance ISD review and approval of instructional materials developed to support resident courses. These checklists (see *Chapter 7, Appendix U*) are the same guidelines that should be used at this stage to ensure materials are developed IAW overall standards outlined in the SOP. In short, the ISD professional conducting this review should follow the steps below:

Step 1: Select the appropriate checklist from Chapter 7 (i.e. if reviewing job aids, select the job aid checklist).

Step 2: Ensure all quality standards are included. If discrepancies are noted in the review, discuss with the course developer, and return checklist with the material reviewed.

Step 3: Course developer makes revisions, as appropriate. If revisions are necessary, submit the material for QA review again until final approval is received and it is ready for pilot/validation.

Part 3: Testing Course Materials

Overview

Developmental, or beta, testing is analogous to verification or internal acceptance testing performed in a product development setting. As materials are developed, they should be validated and tested to ensure the materials – as designed and developed – achieve the intended learning outcome.

The purpose of developmental testing is to determine the extent to which instructional products meet training system specifications, technical accuracy requirements, and user acceptability criteria. In other words, asking whether the particular instructional component (job aid, test, exercise, etc.) works as intended, or are adjustments required. These small-scale try-outs test a particular element of the instruction.

The purpose of a beta test is to put more of the instructional elements together in order to have a test run through the instruction and iron out the order, timing, or flow, and ensure that the compiled materials produce the learning outcome intended, all prior to a full course pilot test.

Part 3: Testing Course Materials, Continued

Developmental Testing

Developmental testing is performed as soon as draft instructional materials/activities are produced. It's valuable to try out and evaluate elements of the instructional product early and often, rather than waiting for the entire product to be developed, and then discovering problems with the materials. Addressing problems early will help keep your development on track.

The following steps outline the developmental testing process:

Step 1: Prepare for developmental testing of the element(s) of the instructional materials.

Step 2: Conduct developmental test for each element.

Step 3: Record results.

Step 4: Analyze results and determine any required revisions.

Step 5: Make revisions to the materials.

Step 6: Conduct beta test for a module of instruction (if applicable).

Step 7: Update materials as necessary.

RESULT: Materials are ready for the pilot test.

Beta Testing

During the Development phase of the ISD process, beta testing may be conducted in one of the following manners:

- Testing instructional materials to limited audience of individual and small-groups
- Small-group evaluation of the instruction prior to final validation testing

In the next chapter, you will learn about pilot delivery, or final validation, which ensures that instruction is capable of producing confident graduates who meet job performance requirements.
