

PHASE IV: IMPLEMENT

INTRODUCTION

In this section, we will deal with planning, staff development, and validation concerns for the pilot implementation of a new, or significantly revised, course. Most of these issues also apply to subsequent iterations of the course, but become fairly routine over time. Validation issues, after the pilot implementation of the course, move to the final phase (addressed in the next chapter).

Pilot implementation is the first real-world test of a course in its entirety. Careful planning and staff development minimizes problems in conducting the course during pilot implementation and makes it easier to find the flaws that need to be corrected. A validation plan ensures that the curriculum is critically reviewed during the pilot implementation.

GENERAL PLANNING

Develop a detailed Plan of Action and Milestones (POA&M) for preparing for the pilot implementation as early as possible. For new courses, the training program manager may require a POA&M. As a minimum, establish estimated start and completion dates in the POA&M for the following:

1. Ordering equipment, supplies, and materials.
2. Scheduling use of classroom and laboratory spaces, instructors, equipment, and media.
3. Conducting staff development.
4. Duplicating or printing materials for instructors and students.
5. Collating materials for students.
6. Developing a validation plan.

STAFF DEVELOPMENT

The function of staff development for pilot implementation is to ensure that **every** instructor is familiar with **all** parts of the course or program and prepared to instruct his/her assigned portion of the course.

Preparing to instruct an assigned portion of the course is largely a matter of self-development on the part of individual instructors. Each instructor must become thoroughly familiar with the learning objectives, content, learning activities, and media that will be used in each segment he/she will teach.

Ensuring that every instructor is familiar with all parts of the course may be more difficult. Telling instructors that they must be familiar with all of the curriculum is rarely sufficient. The priority for the instructors will be preparing their own segments. Time may well run out before they get around to reviewing the other segments. One way around this is to schedule briefing sessions where each instructor presents an overview of the lessons he/she will teach.

Instructors must be trained to use performance and product evaluation instruments. Make sure that all instructors understand the grading criteria and use a consistent definition of “correct performance” or “acceptable product” for evaluating student performance and products.

Staff development may also be needed to teach instructors how to use unfamiliar methods or media.

Staff development plans do not require approval from higher authority. The academic director or training director is responsible for ensuring that the staff development plan is adequate and that sufficient time and resources have been allocated for staff development.

VALIDATION PLAN

The validation plan identifies the data collection and analysis methods that will be used to monitor training. Normally, the validation plan is developed by the instructional systems specialist assigned to the course or program. The instructional systems specialist determines what data needs to be collected and the methods that will be used to analyze it. As a minimum, the validation plan will include data collection and analysis methods for class achievement, validity and reliability of evaluation instruments, student feedback, and instructor feedback. The validation plan does not require approval by higher authority. A sample validation plan is shown in Figure 5-1 on page 5-5.

Class Achievement

Collecting and analyzing data on class achievement helps to identify problem areas in a course. These problem areas may involve the successful or unsuccessful accomplishment of the course objectives, the effort that was exerted by students to achieve the criteria, or the number of students who finished the course or were set back. As a minimum, the validation plan will include a definition of acceptable achievement and a statement of what areas will be studied if the achievement goal is not met.

Acceptable class achievement is usually defined in terms of a percentage of the class achieving a specific level of performance for each section (i.e., unit or lesson topic). This designated level of class performance signifies accomplishment of the training objectives. Class achievement may be defined at two levels, one for the percentage of students passing a unit or lesson topic and one for the percentage of students attaining a specified level of performance above passing. Example: *At least 90% of the students will achieve a passing grade for each lesson and at least 70% of the students will achieve a grade of 85% or better on each unit.*

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The validation plan next defines the areas to be studied if the goal established for class achievement is not met. By analyzing traits common to unsuccessful students or common problem areas, the instructional systems specialist and program developer can identify patterns. Course problems indicated by these patterns may be associated with student selection, the sequence of material, or units and lesson topics that are too difficult or taught without enough background information.

Common Traits of Unsuccessful Students: Patterns occurring in students with common traits may indicate that certain entry prerequisites must be set or raised. For example, in a course or program that requires math computation, it may be necessary to establish high school algebra as a prerequisite if most successful students took an algebra class in high school and most unsuccessful students did not. Similar commonalities occurring with scores on the Armed Services Vocational Aptitude Battery (ASVAB) may indicate that ASVAB requirements for the course need to be raised or waivers should not be granted. Some other areas where commonalities may be found are student rate or rank, time in rate or rank, or time in service.

Common Problem Areas for Unsuccessful Students: Patterns occurring among unsuccessful students in particular areas of the course may indicate problems with units or lesson topics. If unsuccessful students are missing the same test items or performance items, an analysis of the unit or lesson topic being tested may reveal that all the steps to a procedure or process are not being taught. A high number of student setbacks or drops in a particular unit or lesson topic may indicate a problem with the sequence of material (i.e., anatomy and physiology should be taught before emergency conditions). Patterns occurring in a particular unit or lesson topic could indicate the inclusion of difficult concepts that could be better understood if broken down into smaller learning blocks. Students may need more practice time or a different instructional method may be indicated.

Validation Plan

Class Achievement

- Acceptable class achievement: At least 95% of the students will achieve a passing grade on each unit; at least 90% will do so without retesting.
- Investigation of unacceptable class achievement

Review for common traits among unsuccessful students for possible recommendations regarding prerequisites.

Review for common failure points and recommend solution.

Validity and Reliability of Evaluation Instruments

- Analyze responses to all high-miss items (i.e., items missed by 20% of class)
High vs low scoring students: Compare number of misses from top and bottom third of class based on overall test scores; review for content validity and revise or delete item if more than 30% or more of incorrect responses come from high scoring students.
Common patterns for incorrect responses: Determine number of “hits” on same incorrect response; review for content validity and possible revision if same response accounts for 30% or more of incorrect responses.
- Analyze test structure (item mix, item construction, comparison to LTG) for all written tests with a retest rate of 10% or higher.
- Analyze for interrater reliability on any performance or product evaluation with a retest rate of 10% or higher.
- Review LTG content and instructional methods for any segment of a unit with a retest rate on any written test or performance/product evaluation of 10% or higher.

Student Feedback

- Administer student questionnaires at the end of each unit; investigate any item with a negative response from more than 15% of the class.
- Elicit input from students during post-test review sessions.

Instructor Feedback

- Have instructors complete the lesson evaluation form (see attached) at the completion of each lesson; summarize and review all negative comments during staff meetings.

Figure 5-1: Sample Validation Plan.

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Validity and Reliability of Evaluation Instruments

Monitoring the validity and reliability of evaluation instruments ensures that they are good indicators of student achievement and that they evaluate the same standards from instructor to instructor or student to student.

The validation plan should state the criteria for deciding to conduct a detailed analysis of individual tests and test items. The primary purpose of test item analysis is to detect bad test items. The analysis does not provide an absolute indication that an item is or is not flawed and does not tell how to correct flawed items. Test item analysis "flags" potentially flawed test items and "suggests" the nature of the problem or the part of the item that is flawed. Once identified, these areas can be examined and needed changes made. As with class achievement, high missed test questions, items missed by high scoring students, and high missed items on the same distracter are "flags" which could be criteria for conducting a test item analysis.

Include descriptions of the following in the validation plan:

1. Criteria for conducting a test item analysis.
2. Method(s) for establishing reliability of a suspect test or item.
3. Method(s) for establishing validity of a suspect test or item.

Student Feedback

Student feedback provides additional evaluation of the effectiveness of the instructional materials and strategies from the students' point of view. This feedback may be gathered through questionnaires or through meetings with students. As a minimum, the validation plan will state how student feedback on the course will be gathered. If possible, criteria should also be established for when student responses indicate a need for further investigation of the effectiveness of the instructional materials or presentation. For example, is it sufficient that a majority of the students find the materials and methods effective and appropriate?

Student Questionnaires

Questionnaires may be developed to assess the effectiveness of instruction from the students' perspective. These questionnaires may be administered after each lesson topic or unit, at the conclusion of a group of units, and at the conclusion of the course. Administer questionnaires frequently enough to ensure that responses can be tied to specific instructional materials or methods. When a program is going through pilot implementation, student feedback is normally obtained for each unit (new programs) or for each revised unit (existing programs with extensive revisions).

The most common format for student questionnaires uses a Likert scale. A Likert scale allows the person completing the questionnaire to indicate degrees of agreement or disagreement with a series of statements. Figure 5-2 provides a sample of a student questionnaire using an attitude scale from (5) indicating strong agreement to (1) indicating strong disagreement.

Variations on the Likert scale may be used to more accurately reflect the attitudes being surveyed. Generally, the higher the total score the more favorable the attitude. There are statistical analysis methods available to more accurately measure the reliability and validity of the questionnaires, if desired. Otherwise the questionnaires can be used as a simple method for obtaining feedback.

Keep the statements on the questionnaire pertinent to the segment of the curriculum being evaluated. Avoid including statements that will be marked "not applicable" (e.g., a statement dealing with audiovisual aids for a unit or lesson topic that doesn't include audiovisuals). Ideally, a separate questionnaire would be developed for each lesson or unit being evaluated, but this may be too time consuming to be practical. One way around this is to generate a general purpose questionnaire that includes all of the elements that might be needed for any lesson or unit. This "master set" of statements can be kept on a computer and easily modified to fit each segment.

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UNIT EVALUATION: Student Questionnaire

Course: _____ Unit: _____ Instructor: _____

Class #: _____ Date: _____

Please enter the number from the rating scale that indicates your level of agreement with each of the statements below.

Rating Scale:

(5) Strongly Agree; (4) Agree; (3) Undecided; (2) Disagree; (1) Strongly Disagree

A. UNIT CONTENT

- _____ The objectives for the unit were clear.
- _____ The subject matter was easy to follow.
- _____ The topics were presented in a logical sequence.
- _____ The objectives (terminal and enabling) were accomplished.
- _____ Instruction time was sufficient.
- _____ The pace at which the lesson material was covered was appropriate.

B. UNIT MATERIAL

- _____ The visual aids were appropriate.
- _____ The visual aids were sufficient in quantity.
- _____ The visual aids were helpful in understanding the material.
- _____ The texts were helpful in understanding the material.
- _____ The exercises were helpful in understanding the material.
- _____ The student handouts were helpful in understanding the material.

C. QUIZZES/TESTS

- _____ The grading criteria were explained before the quizzes and tests.
- _____ Quiz/Test questions covered the material that was taught.
- _____ There was sufficient time to practice prior to exams.
- _____ The practical/laboratory exams were fair.

D. INSTRUCTOR METHODS

- _____ The instructor was well prepared.
- _____ The instructor was enthusiastic.
- _____ The instructor was thorough.
- _____ The instructor maintained class control.
- _____ The instructor created an interest in the topic.
- _____ The instructor used audiovisual equipment effectively.

E. YOUR REACTIONS

- _____ I felt free to ask questions.
- _____ I found this unit challenging.

Please use the reverse for any additional comments you may wish to make.

Figure 5-2: Questionnaire for Student Feedback on Unit.

Care must also be taken to ensure that the statements in the questionnaire pertain to the unit of instruction being evaluated and do not reflect personal attitudes. Questionnaires are used to evaluate the pertinence of instructional methods and materials to the ability of the students to master objectives.

Student/Instructor Meetings

Meetings between students and instructors may also be used to obtain immediate feedback. Such meetings may elicit more detailed information than questionnaires. Group meetings between the instructor and the class may clarify problems that an entire class experienced. Such meetings are also more apt to elicit specific positive feedback. Students tend to focus on negative aspects when responding to questionnaires and are generally more vocal about the parts of the instruction that they found particularly useful or enjoyable during an informal discussion of how they felt about the lesson or unit.

Instructor Feedback

Instructor feedback is also useful in evaluating the effectiveness of instructional materials and strategies. As a minimum, the validation plan will state how instructor feedback will be gathered.

As with student feedback, questionnaires may be used to obtain instructor feedback or meetings may be held with the instructors to let them express their reactions to the curriculum. Instructors are particularly good at pin-pointing problems with timing (both how much time is assigned to a segment of the training and where the segment is scheduled), problems with the content or organization of the lesson topic guides, and problems with the amount and types of practice available to the students.

Questionnaires for instructor feedback on a course may be similar to the student questionnaires described above, or may be more subjective and

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open-ended. Typically, such questionnaires are completed following each lesson topic and focus on the effectiveness of the materials specified for the lesson and the adequacy of the time allotted.

Meetings to obtain instructor feedback on the curriculum are usually held at the end of a unit or group of units. Meetings may be structured to address specific issues from student and/or instructor questionnaires or may serve as the primary means of gathering instructor feedback. Brainstorming sessions with all the instructors involved with the course or a segment may also be useful in generating solutions to problems or potential problems already identified.

FINAL APPROVAL

During the pilot implementation, follow the validation plan to monitor the effectiveness of the curriculum, instructional materials, and instructional methods. If the curriculum requires substantial further revisions, submit a validation report detailing the problems that were found during the pilot implementation and the revisions that will be made to address the problems. Include a POA&M for completion of the revisions with the validation report. If the curriculum requires only minor adjustments that can be put in place with the next convening class, no validation report is required. Simply send a letter to the training program manager advising him/her that a second pilot implementation will be needed (he/she may ask for additional information).

Once pilot implementation is complete, submit the documentation for the course to the training program manager for final approval.