

Concept	Analyze	Design	Develop	Implement	Evaluate
	Identify the probable causes for a performance gap	Verify the desired performances and appropriate testing methods	Generate and validate the learning resources	Prepare the learning environment and engage the students	Assess the quality of the instructional products and processes, both before and after implementation
Common Procedures	1. Validate the performance gap 2. Determine instructional goals 3. Confirm the intended audience 4. Identify required resources 5. Determine potential delivery systems(including cost estimate) 6. Compose a project management plan	7. Conduct a task inventory 8. Compose performance objectives 9. Generate testing strategies 10. Calculate return on investment	11. Generate content 12. Select or develop supporting media 13. Develop guidance for the student 14. Develop guidance for the teacher 15. Conduct formative revisions 16. Conduct a Pilot Test	17. Prepare the teacher 18. Prepare the student	19. Determine evaluation criteria 20. Select evaluation tools 21. Conduct evaluations
	Analysis Summary	Design Brief	Learning Resources	Implementation Strategy	Evaluation Plan

Chapter 3

Develop

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Abstract The purpose of the Develop phase is to generate and validate selected learning resources. Upon completion of the Develop phase, you should be able to identify all of the resources that will be needed to undertake the planned episodes of intentional learning. By the end of the Develop phase, you should also have selected or developed all of the tools needed to implement the planned instruction, evaluate the instructional outcomes, and complete the remaining phases of the ADDIE instructional design process. The result of this phase is a comprehensive set of learning resources, such as all of the content, instructional strategies, and other lesson plans, educational media needed to support the learning modules, a comprehensive set of directions for each instructional episode and independent activities that facilitate the student’s construction of knowledge and skills, a comprehensive set of directions that will offer guidance to the teacher as he or she interacts with the students during the course of the planned instruction, a formative evaluation plan, and a summary of significant revisions that were made during the Develop phase. During the meeting where the learning resources are presented to the client, the focus should be on communicating the confidence of the design team in the learning resources being able to close the performance gap for the causes due to a lack of knowledge and skills.

Keywords Develop · Evaluate · Instructional design · Knowledge and skills · Formative evaluation · Summative evaluation · Performance gap · Media · Instructional media

Introduction to Develop Phase

The purpose of the Develop phase is to generate and validate selected learning resources. The common procedures associated with the Develop phase are as follows:

11. Generate Content
12. Select or Develop Supporting Media
13. Develop Guidance for the Student
14. Develop Guidance for the Teacher
15. Conduct Formative Revisions
16. Conduct a Pilot Test

Upon completion of the Develop phase, you should be able to identify all of the resources that will be needed to undertake the planned episodes of intentional learning. Further, by the end of this phase, you should have selected or developed all of the tools needed to implement the planned instruction, evaluate the instructional outcomes, and complete the remaining phases of the ADDIE instructional design process.

The result of this phase is a comprehensive set of learning resources. The primary resources that should be available at the end of this phase are the following:

1. Content
2. Sources for additional content
3. Lesson plans
4. Instructional strategies
5. Selected media to facilitate the learning process
6. A comprehensive set of directions for each instructional episode and independent activities that facilitate the student's construction of knowledge and skills
7. A comprehensive set of directions that will offer guidance to the teacher as he or she interacts with the students during the course of the planned instruction
8. A formative evaluation plan
9. A summary of significant revisions
10. The results of a pilot test

During the meeting where the learning resources are presented to the client, the focus should be on communicating the confidence of the design team has in the learning resources being able to close the performance gap for the causes due to a lack of knowledge and skills. If the client is satisfied, then obtain the appropriate endorsements and proceed to the Implement phase. The remainder of this chapter is devoted to the common procedures of the Develop phase.

Generate Content

Objective Generate learning plans.

You Should Already Know

- A. The specific performance objectives for all of the instructional goals
- B. The testing strategy for judging the degree of success
- C. The test items for the performance objectives
- D. Any functional specifications required to support the learning context

Content Introduction

Content is the focal point for engaging the student during the process of knowledge construction. However, content should be strategically introduced during the teaching and learning sessions. Thus, instructional strategies become the overt means by which knowledge, skills, and procedures are exchanged during an episode of intentional learning. Effective episodes of intentional learning should have a beginning, middle, and an end. Instructional strategies organize the external events that occur during each learning episode.

Instructional Strategies: *Concept*

Student-centered strategies should be the guiding framework for accomplishing the performance objectives. The planned activities should be based on the performance objective and the student's background. While the goals and objectives remain constant, the prerequisites and communication methods will vary depending on a student's reason for participating in an instructional episode (motivation), a student's capacity to construct knowledge and skill (rate), and a student's expression for how she or he prefers to learn (style). Instructional strategies should seek to accommodate the student's motivation for learning, the students' rates of learning, and the each student's learning style.

Instructional Strategies: *Theory*

An instructional strategy is defined as the organization and sequence of learning activities. The learning activities are an attempt to arrange a set of external events to facilitate the interpretation, construction, and manifestation of knowledge and skills for a

student. The events of an instructional strategy will vary depending on the context, resources, and needs of the students. The names of the events and activities may vary due to legacy systems and current trends, but the theories remain essentially the same. A complete instructional strategy should have a beginning, middle, and an end. Therefore, beginning activities, middle activities, and ending activities mark each episode.

Beginning Activities

Begin episodes with

- Motivational tasks (gain students' attention)
- Information about the expectations (clarify the objectives)
- Confirmation of the prerequisites
(review knowledge and skills required to start this episode)

Middle Activities

Middle activities tend to facilitate the most interaction between the student, teacher, media, and content. Content exchanges are the vehicles whereby learners have an opportunity to acquire knowledge and build skills. Effective content exchanges and skill building activities include

1. Demonstrations
2. Role plays
3. Simulations
4. Discussions
5. Presentations
6. Case-based exercises
7. Project-based exercises
8. Games
9. Observation
10. Group question development
11. Peer teaching
12. Peer review

Other Middle Activities incorporate opportunities for:

- *Guided Practice*
Guided practice provides opportunities for the teacher or a student to lead peers in specific activities related to the objective. Guided

practice events are developed to move the student from known to unknown, easy to difficult, simple to complex, and concrete to abstract.

- *Independent Practice*

Independent practice provides opportunities for the student to exhibit the knowledge and skills encumbered in the objective. Independent practice events are developed to simulate the expectations of the student in performance space.

- *Feedback*

Feedback provides opportunities to determine student progress. Feedback events are developed for the teacher and the student to make necessary adjustments during an episode.

- *Assessment*

Assessment provides opportunities to test new knowledge and skills constructed by the student. Assessment events are developed to ascertain the potential for a student to perform specific tasks outside the learning space.

Ending Activities

An extremely important event is closure. Closure helps the student connect the knowledge, skills, and procedures that were introduced during the episode. Closure can include activities such as

- a. Debriefs at the end of activities
- b. Transitions from one episode to another episode
- c. Review activities
- d. Summaries
- e. Action Plans

Instructional Strategies: *Practice*

There are many effective application frameworks that implement the beginning, middle, and end theory of instructional strategy development. However, this book has chosen to focus on a single application framework called the nine events of instruction. Dr. Robert M. Gagné (1916–2002), Professor Emeritus of Educational Psychology and Instructional Design, developed a method for organizing different instructional strategies within the scope of a single lesson. Professor Gagné's method of organization has come to be known as *Gagné's Nine Events of Instruction* (Fig. 3.1).

Gagné's Nine Events of Instruction

Theory	Event	Sample Activity
Reception	1. Gaining Attention	a. Share a current event about a classmate b. Begin with question: "What do you think?" c. Initiate the class in a foreign language or jargon
Executive Control	2. Inform Learner of Lesson Objectives	d. Review course objectives in terms of WIIFM e. Post objectives in outline form f. Video demonstrations of actual performance
Retrieval	3. Stimulating Recall of Prior Learning	g. Pre-test of existing skills or knowledge h. Draw concept map of current perceptions about topic i. Students summarize prerequisite knowledge and skills
Selective Perception	4. Presenting Stimulus with Distinctive Features	j. Multimedia introduction of knowledge and skills k. Content information presented in a storytelling format l. Subject matter expert as a guest presenter
Semantic Encoding	5. Guided Learning	m. Demonstrate skill or knowledge application n. Conduct experiment with teacher–student collaboration o. Use physical model to portray relationships
Response Organization	6. Eliciting Performance	p. Role play based on genuine scenarios q. Rehearsed simulation games r. Construct job aids displaying relevant skills
Reinforcement	7. Providing Informative Feedback	s. Peer critique during the instructional episode t. Suggest alternatives to achieve same results u. Provide "what if" questions
Activate Retrieval	8. Assessing Performance	v. Test of new knowledge and skill presented w. Learner fabricates alternatives to those presented x. Learner constructs summary of new information
Providing cues	9. Enhancing Retention and Learning Transfer	a. Hand out job aids relevant to the topic. b. Learners adopt a set of authentic examples. c. Recommend knowledge and skills required to succeed.

Fig. 3.1 Gagne's nine Events of Instruction¹

¹ Adapted from Gagné, R. M., Wager, W. W., Golas, K. C., & Keller, J. M. (2005). *Principles of instructional design*, 5th ed. United States: Thomson Wadsworth.

The reference for a learning episode is the performance objective. A single episode can have multiple objectives, but one objective per episode is recommended for beginner designers. Episodes can be combined as deemed appropriate. Figure 3.2 is an example of a learning episode based on Gagné’s nine events of instruction.

An Example of a Learning Episode
Lesson Title: “Working as a Team”

Event	Instructional Strategy	Teacher or Student
Motivation	You, as the teacher, are the convener of an undergraduate student group that is about to form a team to work on a class project. The following fictional scenario occurred: <i>Fictional scenario: The last of the eight students arrive at the meeting wearing a T-shirt that says, “Club faggots, not seals.” Another student says, if he stays, I’m leaving.</i> What should the teacher do?	Student: Form opinions about the scenario
Objective	Identify the roles and responsibilities of a project team in preparation for the initial client meeting according to Oriel’s (1996) Team Handbook	Teacher: Inform the students that they will be expected to form a project team and choose a Project Manager
Prerequisite	Define major terms, concepts, and models related to project management	Student: Contribute to a brief class discussion about the terms, concepts, and models already learned about project management

Fig. 3.2 Sample lesson plan based on Gagné, R. M., Wager, W. W., Golas, K. C., & Keller, J. M. (2005). *Principles of instructional design*, 5th ed. United States: Thomson Wadsworth

Content	Introduction A team is . . . <i>[insert content here]</i> Interpersonal skills and working as a team . . . <i>[insert content here]</i>	Teacher: Presents the topic information and other case scenarios about forming project teams
	<i>Concept</i> The conceptual framework for working as a team is based on stages of forming, storming, norming, performing and adjourning. Each stage . . . <i>[insert content here]</i> <i>Theory</i> Group dynamics theory . . . <i>[insert content here]</i> . Conflict resolution theory . . . <i>[insert content here]</i> <i>Practice</i> Characteristics of constructive feedback and destructive feedback are manifested . . . <i>[insert content here]</i> <i>The sample tools below facilitate the effective formation of work teams.</i> <i>[Insert samples here]</i>	 Student: Shares past experiences that relate to working as a member of some type of team Teacher: Directs student attention to content projected on the screen about concepts, theories, and practices associated with effective teaming exercises Student: Recall knowledge and skills already possessed about the topic Student: Determine the tasks that will require the most attention during the practice sessions
Guided Practice	Scrutinize the <i>Sample Case</i>	Teacher: Discuss a variety of reactions during different stages of team meetings

Fig. 3.2 (continued)

		Student: Recommend appropriate responses to personality conflicts and other challenges to the work of the project team
Independent Practice	Apply the appropriate knowledge and skills to the <i>Practice Case</i>	Student: Propose appropriate responses to the conflicts and challenges presented in a hypothetical situation
Feedback	Provide opportunity for each student to correct his or her answers	Teacher or Student: a. Suggest alternatives to achieve same results b. Provide “what if” questions
Assessment	Inform the student about her or his performance relative to the objective criteria	Teacher: Provide additional explanations about what most students got correct and the thing that was commonly mistaken
Closure	Summarize and reinforce the following ideas: • Different personalities are part of a team • Project goals should guide teamwork • Next step is project management plan	Student: Review the job aid distributed in class in preparation for the next episode

Fig. 3.2 (continued)

Practice Opportunity Review the sample case in Fig. 3.3 and change it to make it better.

Sample Case
Episode Title: Responsibility versus Authority

Event	Instructional Strategy	Teacher or Student
Motivation	True or False? Responsibility and Authority are the same	Teacher: Projects an image suggesting both terms are equal
Objective	Explain the concepts of responsibility and authority in terms of liability and consequences	Teacher: Restates the objective statement verbatim in a monotone voice
Prerequisite	The major phases of project management The importance of diversity to a project team While there is a single team leader for the project, every team member should be responsible for leading a sub-section of the project	Student: Brings a note from their academic advisor saying they are ready for this course
Content	Responsibility and authority are different. Responsibility and authority are often confused and sometimes treated the same, but they are different. Responsibility describes someone who has a duty or obligation, and capable of distinguishing between right and wrong, trustworthy and dependable. Authority is the right to determine, adjudicate, or otherwise settle issues and disputes, the right to control and command. Authority can be delegated, but responsibility cannot be delegated. Delegation is when an individual acts or represents others with the right to make final decisions in his or her	Teacher: Uses lecture notes to present the information in the column to the left

Fig. 3.3 Sample lesson plan based on Events of Instruction

	area of responsibility and remains accountable to his or her supervisor for the final results Without delegation of authority, there can be no progress. If authority is not delegated, progress ceases after growth to a certain point. Progress ceases simply because one person is only capable of controlling effectively a limited number of people depending on his or her position in chain of command. A good project manager should strive to excel regardless of his or her position in the chain of authority. He or she should recognize that authority could be delegated to his or her subordinates but never the project manager's responsibility Being a responsible person and being responsible for a particular incident are two different entities. This is not to say that in the event of a gross mistake or any particular error, which the person directly responsible for an action won't meet with certain consequences or reprimands or both Once a supervisor has delegated authority of another, he or she should cease to interfere with the subordinates under the person to whom this authority has been given. If authority is only delegated originally to accomplish a certain job, then the supervisor must follow up to see that the job is completed. Responsibility for completion is still the project manager's job	
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Fig. 3.3 (continued)

	The project team consists of the full-time and part-time resources assigned to work on the deliverables of the project. The entire team is responsible for - Understanding the work to be completed - Planning out the assigned activities in more detail if needed - Completing assigned work within the budget, time line, and quality expectations - Informing the project manager of issues, scope changes, risk and quality concerns - Proactively communicating status and managing expectations The project team can consist of human resources within one functional unit of an organization, or it can consist of members from several functional units. A cross-functional team has members from multiple units. The Project Manager is the team leader. The project manager and the team members of a project determine the success or failure of a project	
Guided Practice	Review each of the following roles and responsibilities and identify the responsibility and authority limits for each of the management roles: - General Manager - Client - Project Manager - Supplier - End User	Teacher: Guides students through examples that are simple, consistent, and authentic Student: Ask questions about the similarities and differences of the roles and responsibilities presented by the teacher

Fig. 3.3 (continued)

Independent Practice	Compose a job description (200–400 words) for any of the following positions: Client Project Manager Functional Manager General Manager Program Manager Director	Student: Works independently to create job descriptions as guided by the teacher
Feedback	Provide opportunity for each student to revise his or her answers	Student: Consult with another student about the reasons for their descriptions
Assessment	Instructor judge objective achievement from the results of independent practice	Teacher: Provide an additional explanation about what most students missed
Closure	Distribute a job aid that describes the main duties of each stakeholder according to industry standards	Teacher: Ask to review the job aid before next class and introduce next class

Fig. 3.3 (continued)

Practice Opportunity Practice your knowledge and skills about *Generating Instructional Strategies* creating a single learning episode using the template in Fig. 3.4 based on Gagne’s nine events of instruction and using the content from the Firefighter Case in Appendix A.

Practice Case

Event	Instructional Strategy	Teacher or Student
Gain Attention		
Objective		
Prerequisites		
Present the Content		
Guided Practice		
Independent Practice		
Feedback		
Assessment		
Closure		

Fig. 3.4 Template for generating evaluation lesson plan

Closure Each learning episode should have a distinct beginning, middle, and an end. Instructional strategies provide the direction for developing the remaining learning resources such as the media to support the intentional learning events, the formative evaluation activities, and the Pilot Test. Effective instructional episodes provide opportunities for students to practice the performances that will be expected of them at the conclusion of the course of study.

Select or Develop Media

Objective Select or develop media sufficient to accomplish the performance objective(s) as well as the remaining ADDIE procedures.

**You Should
Already Know** A set of objectives.

Content Introduction

The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition.²

Whether you agree with the statement above or not, the position here is that effective media facilitates the construction and retention of knowledge and skills. Instructional media are intended to enrich the learning experience by using a variety of tangible items to facilitate the performance objectives.

Media should be chosen to support an instructional event. Do not choose instructional events to support a medium. All of the events of instruction should be mediated, although a single episode may have different types of media. Instructional media should facilitate student movement from

- Known to Unknown
- Easy to Difficult
- Simple to Complex
- Concrete to Abstract

² Clark, R. E. (1983). Reconsidering research on learning from media. *Review of Educational Research*, Winter, Volume 53, Number 4, page 445.

Media: Concept

Medium = Singular **Media** = Plural

Instructional media are considered tools to extend the capability of the teacher and extend the capability of the student. The process for selecting existing media or developing new media is based on the context, expectations, performance conditions, available resources, culture, and practicality.

Media: Theory

Select media for the following reasons. To

- Enhance the quality of learning episodes. Choose media for the specific purpose of enhancing the quality of the instruction
- Present and reinforce essential knowledge and skills. Media are commonly used to present content. Media also serves as tools for reinforcing key points so that the acquisition of learning is increased. Reinforcing information with different media offers additional opportunities to reinforce the learning without appearing repetitive to the learner
- Accommodate various learning styles. Learning style refers to a group of psychological traits that determine how an individual perceives, interacts within learning environments. There are many types of learning styles and a comprehensive discussion is beyond the scope of this episode; however, three common types of learning styles are noteworthy:
 - Auditory
 - Visual
 - Kinesthetic

Auditory

The auditory learner retains information best if he or she not only hears the information but also has a chance to discuss the information (hear oneself repeat the information).

Visual

Visual students learn most through the visual sense. Such examples include use of pictures, real objects, illustrations, drawings, and video.

Kinesthetic

The kinesthetic learner gains knowledge and skills through the psychomotor sense. He or she needs to move or be part of the action. Media selections that provide the best learning environment for this group of learners includes working with mock-ups and simulators. Hands-on practice for this group aids retention.

Figure 3.5 provides an example of the supporting media for the learning episode “Working as a Team.”

	Media that will be selected or developed to support the Student
Visual	• Whiteboard for making lists and storyboards • PowerPoint slides • Charts describing characteristics of project management • Video of professional project manager telling the real case stories • Handout with case scenarios
Auditory	• Audiotape recorder and blank tapes for students to record stories • Professional project management audiotapes • Peer discussion
Kinesthetic	• Storyboard for students to draw parts of the case scenarios • Videos of professional project manager with sound turned off to demonstrate gesturing and facial expressions • Physical Warm-up exercises • Video Camera for students to video themselves and others past experiences that relate to a team work

	Media that will be selected or developed to support the Type of Learning
Knowledge	• Handouts defining and showing the roles and responsibilities of project team • Team management books for reading a variety of case scenarios
Comprehension	1. Group discussion to help students identify the cons and pros for working as a team 2. Microsoft Word so that students can summarize their discussions
Application	a. Storyboard so that students can practice management planning b. Microsoft Word for students to make lists of planning phrases
Analysis	i. Inspiration Software to produce the story web as a method of analyzing scenario
Synthesis	a. PowerPoint slides for students to present the case scenario they have selected and learned
Evaluation	i. Team work rubric to give students guidelines for assessing other students' project management plan ii. Microsoft Word for case scenario reflection

Fig. 3.5. Example of supporters media

Media: Practice

The most important consideration is to choose the appropriate media that enables the learner to fulfill the performance objective. A general procedure for choosing instructional media:

First: Identify media that matches one or more components of the objective

Second: Indicate the media most appropriate for a specific instructional event

Figure 3.6 presents a sample episode that illustrates supporting media for each of Gagne's nine events of instruction.

An Example of a Learning Episode with Media Identified
Lesson Title: “Working as a Team”

Event	Instructional Strategy	Teacher or Student	Media
Motivation	You, as the teacher, are the convener of an undergraduate student group that is about to form a team to work on a class project. The following <i>fictional scenario</i> occurred: <i>Fictional scenario: The last of the eight students arrive at the meeting wearing a T-shirt that says, “Club faggots, not seals.” Another student says, if he stays, I’m leaving.</i> What should the teacher do?	Student: Form opinions about the scenario	PowerPoint slide
Objective	Identify the roles and responsibilities of a project team in preparation for the initial client meeting according to Oriol’s (1996) Team Handbook	Teacher: Inform the students that they will be expected to form a project team and choose a Project Manager	Class notes

Fig. 3.6 A sample episode that illustrates supporting media for each of Gagne’s nine events of instruction³

³ Sample lesson plan based on Gagné, R. M., Wager, W. W., Golas, K. C., & Keller, J. M. (2005). *Principles of instructional design*, 5th ed. United States: Thomson Wadsworth.

Prerequisite	Define major terms, concepts, and models related to project management	Student: Contribute to a brief class discussion about the terms, concepts, and models already learned about project management	Class notes
Content	Introduction A team is . . . <i>[insert content here]</i> Interpersonal skills and working as a team . . . <i>[insert content here]</i> <i>Concept</i> The conceptual framework for working as a team is based on stages of forming, storming, norming, performing and adjourning. Each stage . . . <i>[insert content here]</i> <i>Theory</i> Group dynamics theory . . . <i>[insert content here]</i>. Conflict resolution theory . . . <i>[insert content here]</i>	Teacher: Presents the topic information and other case scenarios about forming project teams Student: Shares past experiences that relate to working as a member of some type of team Teacher: Directs student attention to content projected on the screen, about concepts, theories, and practices associated with effective teaming exercises	Society for Human Resources Professionals URL Handouts with case scenarios PowerPoint slides

Fig. 3.6 (continued)

	<i>Practice</i> Characteristics of constructive feedback and destructive feedback are manifested . . . [insert content here] The sample tools below facilitate the effective formation of work [Insert samples here]	Student: Recall knowledge and skills already possessed about the topic Student: Determine the tasks that will require the most attention during the practice sessions.	
Guided Practice	Scrutinize the <i>Sample Case</i>	Teacher: Discuss a variety of reactions during different stages of team meetings Student: Recommend appropriate responses to personality conflicts and other challenges to the work of the project team	Handout with case scenario
Independent Practice	Apply the appropriate knowledge and skills to the <i>Practice Case</i>	Student: Propose appropriate responses to the conflicts and challenges presented in a hypothetical situation	Hypothetical, yet realistic, practice case

Fig. 3.6 (continued)

Feedback	Provide opportunity for each student to correct his or her answers	Teacher or Student: dd. Suggest alternatives to achieve same results ee. Provide “what if” questions	PowerPoint slides
Assessment	Inform the student about her or his performance relative to the objective criteria	Teacher: Provide additional explanations about what most students got correct and the thing that was commonly mistaken	Class notes
Closure	Summarize and reinforce the following ideas: • Different personalities are part of a team • Project goals should guide teamwork • Next step is project management plan	Student: Review the job aid distributed in class in preparation for the next episode	Project management job aid

Fig. 3.6 (continued)

Practice Opportunity Review the Sample Case in Fig. 3.7 and change the “Media” column to make the overall lesson better.

Sample Case
Episode Title: Responsibility versus Authority

Event	Instructional Strategy	Teacher or Student	Media
Motivation	True or False? Responsibility and Authority are the same	Teacher: Projects an image suggesting both terms are equal	Lecture
Objective	Explain the concepts of responsibility and authority in terms of liability and consequences	Teacher: Restates the objective statement verbatim in a monotone voice	Role Play
Prerequisite	1. The major phases of project management 2. The importance of diversity to a project team 3. While there is a single team leader for the project, every team member should be responsible for leading a sub-section of the project	Student: Brings a note from their academic advisor saying they are ready for this course	Multiple choice test

Fig. 3.7 Sample case

Content	Responsibility and authority are different. Responsibility and authority are often confused and sometimes treated the same, but they are different. Responsibility describes someone who has a duty or obligation, and capable of distinguishing between right and wrong, trustworthy and dependable. Authority is the right to determine, adjudicate, or otherwise settle issues and disputes, the right to control and command. Authority can be delegated, but responsibility cannot be delegated. Delegation is when an individual acts or represents others with the right to make final decisions in his or her area of responsibility, and remains accountable to his or her supervisor for the final results Without delegation of authority, there can be no progress. If authority is not delegated, progress ceases after growth to a certain point. Progress ceases simply because one person is only capable of controlling effectively a limited number of people depending on his or her position in chain of command. A good project manager should strive to	Teacher: Uses lecture notes to present the information in the column to the left	Notes written on a dry marker board
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Fig. 3.7 (continued)

	excel regardless of his or her position in the chain of authority. He or she should recognize that authority could be delegated to his or her subordinates but never the project manager's responsibility Being a responsible person and being responsible for a particular incident are two different entities. This is not to say that in the event of a gross mistake or any particular error, which the person directly responsible for an action won't meet with certain consequences or reprimands or both Once a supervisor has delegated authority of another, he or she should cease to interfere with the subordinates under the person to whom this authority has been given. If authority is only delegated originally to accomplish a certain job, then the supervisor must follow up to see that the job is completed. Responsibility for completion is still the project manager's job The project team consists of the full-time and part-time resources assigned to work on the deliverables of the project. The entire team is responsible for Understanding the work to be completed		
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Fig. 3.7 (continued)

	Planning out the assigned activities in more detail if needed Completing assigned work within the budget, time line, and quality expectations Informing the project manager of issues, scope changes, risk, and quality concerns Proactively communicating status and managing expectations The project team can consist of human resources within one functional unit of an organization or it can consist of members from several functional units. A cross-functional team has members from multiple units. The Project Manager is the team leader. The project manager and the team members of a project determine the success or failure of a project		
Guided Practice	Review each of the following roles and responsibilities and identify the responsibility and authority limits for each of the management roles General Manager Client Project Manager Supplier End User	Teacher: Guides students through examples that are simple, consistent, and authentic Student: Ask questions about the similarities and differences of the roles and responsibilities presented by the teacher	Overhead Projector

Fig. 3.7 (continued)

Independent Practice	Compose a job description (200–400 words) for any of the following positions: Client Project Manager Functional Manager General Manager Program Manager Director	Student: Works independently to create job descriptions as guided by the teacher	Handouts
Feedback	Provide opportunity for each student to revise his or her answers	Student: Consult with another student about the reasons for their descriptions	Handouts
Assessment	Instructor judge objective achievement from the results of independent practice	Teacher: Provide an additional explanation about what most students missed	Index Cards
Closure	Distribute a job aid that describes the main duties of each stakeholder according to industry standards	Teacher: Ask to review the job aid before next class and introduce next class	A URL for a web site related to the topic

Fig. 3.7 (continued)

Practice Opportunity Practice your knowledge and skills about *Selecting or Developing Media* creating a single learning episode using the template in Fig. 3.8 based on Gagne’s nine events of instruction and using the content from the Firefighter Case in Appendix A.

Practice Case

Event	Instructional Strategy	Teacher or Student
Gain Attention		
Objective		
Prerequisites		
Present the Content		
Guided Practice		
Independent Practice		
Feedback		
Assessment		
Closure		

Fig. 3.8 Template for identifying media to be selected or developed

Closure Each episode of intentional learning should be mediated. Instructional media should facilitate student movement from known to unknown; from easy to difficult; from simple to complex; and from concrete to abstract. Choose media to facilitate each instructional event. Avoid using instructional events to accommodate a particular medium.

Develop Guidance for the Student

Objective Provide information to guide the student through the instruction.

You Should Already Know

1. All of the instructional strategies
2. All of the media that will be required to support the learning episodes

Content Introduction

The term student in this book refers to learners who have accepted the role of novice within a complex intentional learning situation. The student is complex because of the physical, emotional, social, and mental experiences he or she contributes to the learning space. An intentional learning situation is further complicated by the effect of intelligence, cognitive styles, motivation, cultural norms, creativity, and socio-economic status have on behavior patterns during teaching and learning sessions.

The purpose of instruction is to help people learn. Can learning occur without instruction? Certainly. We are continuously encountering and interpreting our environment and the events in it. Learning is a natural process that leads to changes in what we know, what we can do, and how we behave. However, one function of an educational system is to *facilitate intentional learning*. . . .⁴

Providing guidance for navigating the instructional strategies enhances the learning experience. The format of the guiding artifact will vary depending on the instructional goals and the primary delivery system.

⁴ Gagné, R. M., Wager, W. W., Golas, K. C., & Keller, J. M. (2005). Principles of instructional design, 5th ed. United States: Thomson Wadsworth.

Guidance for the Student: Concept

Students can focus better on the learning tasks when informed about what to expect.

Guidance for the Student: Theory

The basic theory for developing guidance for the student is that of *advance organizer*. An *advance organizer* is an overview of the information that will follow. There are variations for developing guidance for the student. Consider these guiding questions:

- i. Do the episodes of intentional learning have an orderly flow?
- ii. Does each learning episode have a logical sequence?
- iii. Does one part of an instructional strategy transition smoothly into the next part of the instructional strategy?
- iv. Does the sequence of content for the student follow the same sequence of content for the teacher?

While there are many ways to frame guiding information for the student, this section focuses on three common types of guiding information:

- a. Organization
- b. Format
- c. Quality

*Guidance for the Student: Practice***Organization**

- i. Title Page
- ii. Copyright
- iii. Acknowledgments Page
- iv. Table of Contents
- v. Body
- vi. Glossary
- vii. Appendix

Title Page

The Title Page announces the training program also sets the stage for what is to come. The title page should be carefully designed for visual appeal because it may be the first thing the participants see when they enter the training environment. The

Title Page is likely to include a graphic symbol or drawing that illustrates the topic especially when it is used as a cover page.

Copyright

Learning materials may or may not include a copyright page; ensure that you know and use the current departmental or company-wide guidelines for copyright designation. The second page is a common place for establishing copyright.

Acknowledgments

The second page is sometimes used for acknowledgments of the team members (including SMEs) who participated on the project. Acknowledgments recognize those who participated in the development of the training, it also provides a “paper trail” to those developers so that they may be contacted for questions or revisions.

Table of Contents

A table of contents is a useful reference tool in any documents over 20 pages in length.

Body

The largest structural component is the body of the Guide, where the content and exercises for each module or section are placed.

Glossary

A glossary that provides a common meaning is a valuable addition to the Guide if the training uses a number of terms that are new to the learner or often misunderstood.

Appendix

The Appendix is an ideal location for placement of items that will change frequently, for example, those that have current

specifications, data, or dates on them. If the item requires more frequent updating than the rest of the Learner Guide, then it should be placed in the Appendix, which is conveniently positioned at the back of the Guide.

Format

Consider the following aspects of module development:

- i. Content presentation
- ii. Exercise presentation
- iii. Sequence within the module

Content Presentation

Every module or section presents the main content. It should be written using the same guidelines as other writing; it should have

- a. a beginning or introduction to the topic
- b. a middle or explanation of new content
- c. examples used to illustrate the content
- d. exercises where the participants will practice the new skill
- e. an ending or summary to the topic

Exercise Presentation

- i. Clearly written directions
- ii. Place for responses (if applicable)
- iii. Place for taking notes

Sequence

The sequence within the module should be consistent from one module to another for ease of use.

Quality

The quality of the Learner Guide is reflected in the structure and module format as well as the guide's layout and design. However, within this category (Quality) the focus will be on the following elements:

1. Clarity
2. Accuracy
3. Consistency

Clarity

1. Is the writing clear?
2. Is it easy to understand?
3. Can you follow the exercise directions?
4. Is the reading level appropriate for the audience?
5. Is jargon minimized and carefully defined?
6. Are new terms defined?
7. Are all acronyms identified when first presented in the text?

Accuracy

- Is the grammar usage correct?
- Is the spelling correct?
- Is the punctuation correct?

Consistency

1. Are the modules consistent in structure from one to another (Does each have an introduction and summary, for example?)?
2. Are the modules consistent in layout and design (Does each module have the same size and position for the various headings, for example?)?

Practice Opportunity Review the Sample Case in Fig. 3.9 and change the “Table of Contents” intended for the student to make it better.

Sample Case
Table of Contents Intended for the Students

Water Conservation Unit — Table of Contents	
Title Page.....	i
Copyright.....	ii
Acknowledgements.....	iii
Table of Contents	iv
Unit Overview.....	v
Lesson 1: The Water Cycle.....	1
Essential Question: Where will the water you use today be tomorrow?	
Lesson 1 Assessment	3
Lesson 2: Water Sources in Athens	5
Essential Question: Where does our water come from and how does it get to us?	
Lesson 2 Assessment	7
Lesson 3: Water Conservation	8
Essential Question: What is water conservation and why is it important?	
Lesson 3 Assessment	11
Lesson 4: Water Conservation in Your Home	13
Essential Question: How much water do we waste and what can we do about it?	
Lesson 4 Assessment	15
Lesson 5: Family Water Conservation Plan.....	17
Essential Question: How can I help my family conserve water?	
Lesson 5 Assessment.....	19
Glossary.....	21
Appendix A: Maps	23
Appendix B: Charts.....	26
Appendix C: Handouts.....	29

Fig. 3.9 Sample Case

Practice Opportunity Practice your knowledge and skills about *Developing Guidance for the Student* creating a Table of Contents for the student using the space in Fig. 3.10 and using the content from the Firefighter Case in Appendix A.

Practice Case

Table of Contents Intended for the Student

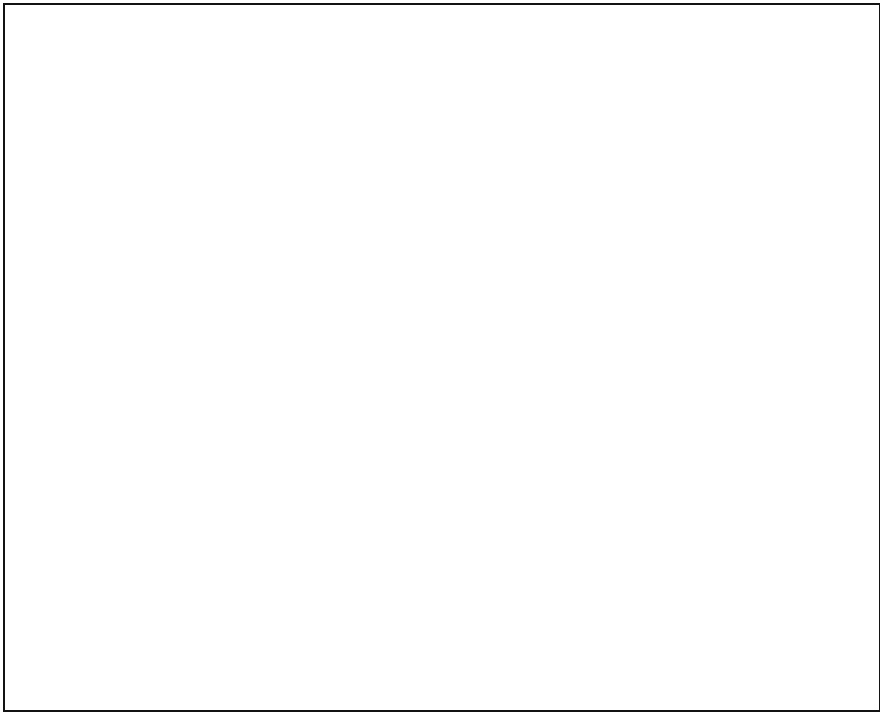
A large, empty rectangular box with a thin black border, intended for a student to create a Table of Contents. The box is currently blank.

Fig. 3.10 Space to practice developing guidance for the student

Closure Provide organizing information in advance of beginning the episodes of intentional learning.

Develop Guidance for the Teacher

Objective Provide information to guide the teacher as she or he facilitates the episodes of intentional learning.

You Should All of the instructional strategies

Already Know All of the media that will be required to support the learning episodes

Content Introduction

The teacher's role is to move *from* being the "Sage on the Stage" to the *Guide on the Side*. Artifacts that guide the teacher are often the vehicles that define the quality of the entire instruction. Guiding artifacts reflect the designer's selection of tasks to be performed by the students, definition of objectives to be fulfilled, selection of instructional strategies, and determine the pace of instruction.

Guidance for the Teacher: Concept

This section focuses on the elements that enable the teacher to guide the student through the planned instructional strategies. There are two main differences between *Student Guide* the *Teacher Guide*:

1. Less blank space is required on the documents devoted to guiding the teacher
2. Graphics are more useful when providing symbols or icons that provide guidance to teachers in facilitating the instruction

Layout and design enhance the ability of the teacher to facilitate the instruction. Clarity, icons for quick reference, and consistency in layout and design all assist the teacher in providing a smooth flow to the course.

Guidance for the Teacher: Theory

The same categories of development that form the guidance for the student also form the guidance for the teacher. However, guidance for the teacher serves a different purpose. While student guides aid the student in learning, the teacher guides aid the facilitator in leading students through the instructional strategies.

Guidance for the Teacher: Practice

The structure of artifacts used to guide the teacher is similar to the artifacts used to guide the student, except additional sections exist. The following sections are added to provide guidance for the teacher:

- A “How to Use This Guide” section
- Symbols or icons that direct the facilitator to take specific actions
- Points of emphasis
- Leading questions
- Answers to leading questions
- Examples
- Directions for when and how to use media
- Directions for exercises
- Debrief questions for every exercise
- Special directions
- Times for each section or exercise
- Tips about learner characteristics, resources suggested, prerequisites
- Suggestions for handling potential challenges

The organization for the Table of Contents for the Teacher (Fig. 3.11) is similar to the Table of Contents for the student, *but adds several sections*:

- Title Page
- Copyright
- Acknowledgments Page
- Table of Contents
- How to Use this [Artifact]
- Revisions and Updates
- Special Instructions
- Symbols and Icons Legend
- Body
- Glossary
- Appendix

Sample Case
Table of Contents Intended for the Teacher

Table of Contents	
Title Page.....	i
Copyright.....	ii
Acknowledgements.....	iii
Table of Contents	iv
How to Use this Guide.....	v
Symbols and Icons Legend.....	vi
Revisions and Updates.....	vii
Background Information.....	viii
Unit Overview.....	xx
Lesson 1: The Water Cycle.....	1
Essential Question: Where will the water you use today be tomorrow?	
Lesson 1 Assessment	3
Lesson 2: Water Sources in Athens	5
Essential Question: Where does our water come from and how does it get to us?	
Lesson 2 Assessment	7
Lesson 3: Water Conservation	8
Essential Question: What is water conservation and why is it important?	
Lesson 3 Assessment	11
Lesson 4: Water Conservation in Your Home	13
Essential Question: How much water do we waste and what can we do about it?	
Lesson 4 Assessment	15
Lesson 5: Family Water Conservation Plan.....	17
Essential Question: How can I help my family conserve water?	
Lesson 5 Assessment.....	19
Glossary.....	21
Appendix A: Maps.....	23
Appendix B: Charts.....	26
Appendix C: Handouts.....	29

Fig. 3.11 Practice case

Practice Opportunity Practice your knowledge and skills about *Developing Guidance for the Teacher* creating a Table of Contents for the teacher using the space in Fig. 3.12 and using the content from the Firefighter Case in Appendix A.

Practice Case
Table of Contents Intended for the Teacher

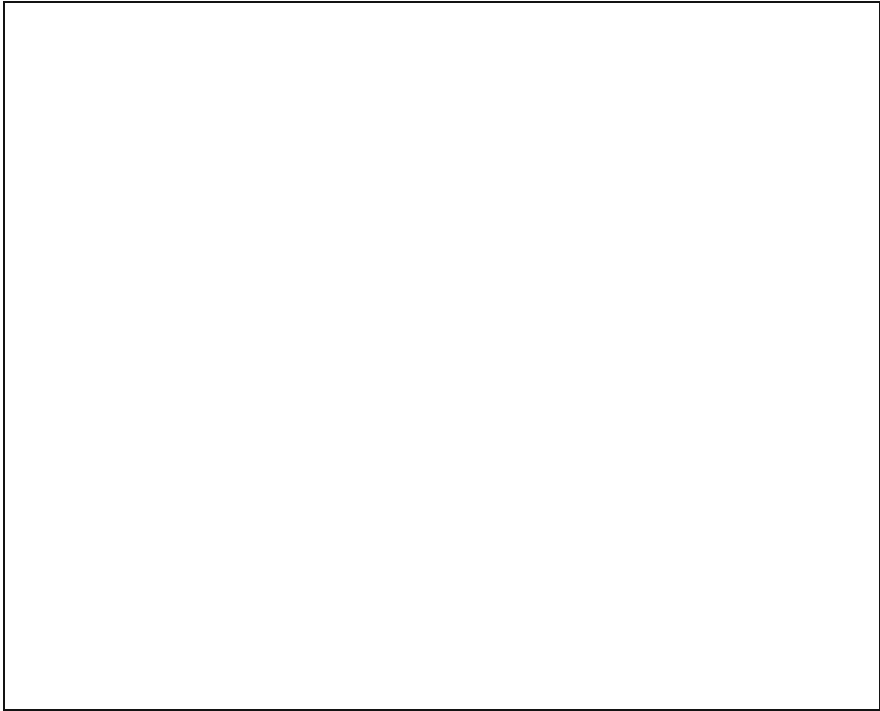
A large, empty rectangular box with a thin black border, intended for the user to create a Table of Contents. It occupies the central portion of the page below the title and above the caption.

Fig. 3.12 Space to practice developing guidance for the teacher

Closure Provide facilitating information in advance of beginning the episodes of intentional learning.

Conduct Formative Revisions

Objective Revise the instructional products and processes prior to implementation.

You Should Already Know That all of the learning resources at various stages of draft form are available for trials.

Content **Introduction**

Stufflebeam once said, “The purpose of evaluation is to improve rather than prove.”⁵ Instructional Designers use evaluation for the specific purpose of improving the designed instruction so that it can fulfill its goal of reducing the performance gap. There are two main types of evaluation used in the ADDIE approach: (1) Formative Evaluation and (2) Summative Evaluation.

Formative Evaluation

Formative Evaluation is the process of collecting data that can be used to *revise* the instruction *before implementation*.

Summative Evaluation

Summative Evaluation is the process of collecting data following implementation.

Summative evaluation will be discussed in a later section. This episode focuses on *Formative Evaluation*.

The purpose of *Formative Evaluation* is to determine the potential effectiveness of learning resources under development and to identify any learning resources or parts thereof that need to be revised. Formative evaluation also provides opportunities to ascertain student attitudes toward the learning resources and the potential effectiveness of the learning resources.

Conduct Formative Revisions: Concept

Formative Evaluation occurs throughout the ADDIE process. Formative evaluation:

- Initiates the instructional design process
- Permeates the entire instructional design process
- Concludes the develop phase
- Guides post-development procedures

⁵ [Need full Stufflebeam quote here.]

Conduct Formative Revisions: Theory

Formative evaluation in instructional design can be defined as collecting data about how students learn within certain contexts. The data are analyzed and synthesized into meaningful information. Revisions are made based on the data summaries. Performance objectives are the criteria for collecting formative evaluation data. Common data sources include

- Individual Item Analysis
- Embedded Test Item
- Pre-tests
- Post-tests
- Attitude Questionnaire
- Observation

Conduct Formative Revisions: Practice

There are three typical phases of *Formative Evaluation*:

1. One-to-One Trial
2. Small Group Trial
3. Field Trial

One-to-One Trial

The first phase of formative evaluation is the One-to-One trial. The goals of One-to-One trials are to remove the most obvious errors from the planned episodes of intentional learning and the supporting learning resources and obtain initial reactions from stakeholders in the ADDIE process.

Criteria can be established to determine how clear the message is to the stakeholders, and how feasible the instruction is given the time limits or other parameters. This is also a good time to ascertain the potential impact that the planned learning episodes might have on the students' attitudes and the students' perceptions about the value of the instructional goals. One-to-One trials are conducted with individuals of varying ability levels and individuals who likely have varying reasons for participating in the planned course of study. The instructional designer or developer often sits with the individual and obtains feedback as the learner reviews the material. The data are often more qualitative than quantitative during the one-to-one trials and are used to remove the most obvious errors as well as many small ones that are discovered. The instructional developers revise the learning resources based on the data collected during the one-to-one trials and then proceed to conduct small group trials.

Small Group Trial

Small group trials are used to determine the effectiveness of the *revised* instruction and to obtain feedback on the learning resources in their final form. Small group trials include scores on pre-tests and post-tests as well as interviews and questionnaires. The optimum number of a small group can be between 8 and 20. Although the term used to describe the trial is small group, the context should approximate the intended instructional setting.

Quantitative and descriptive information are used to provide feedback from the Small Group Trial. The data are then summarized and used to make revisions. The instructional developers continue making revisions to the learning resources based on the data generated through small group trials prior to the field trials.

Field Trial

The field trial is the final stage of formative evaluation. The purpose of the Field Trial is to determine whether the instruction can be utilized in the intended context. Decisions made as a result of the field trial include whether the student's performance will be adequate to move to the implementation phase and whether the delivery system planned for the instruction strategies is feasible.

There are two common categories of Field Trials:

Non-credit Field Test

Credit-bearing Pilot Test

A non-credit Field Test indicates that the finished instruction is not yet guaranteed to be at the level at which one could give credit or certification that participants have met the objectives. The credit-bearing Pilot Test is the last step in the Development phase and covered in the next section of this chapter.

Practice Opportunity Review the *Formative Revisions Summary* for the Sample Case in Fig. 3.13. Consider ways to improve the quality of the information so that effective formative revisions can be made.

Sample Case
Hypothetical Summary of Formative Revisions

Component	Problem	Data Source	Revision Decision
Purpose	• Too broad • Focused some on lack of resources, rather than exclusively on lack of knowledge and skills	• External reviewers • Project manager • Program manager	• Reduced the scope of the purpose statement • Increased the congruency to the portion of the gap attributable to a lack of knowledge and skills
Goals	• Original list of 22 goals • Too specific	• Other teachers • Peer designers	• Combined original 22 goals down to a list of 7 goals • Focused on main categories of learning
Objectives	• Approximately 10% did not match the corresponding task • Approximately 10% had insufficient prerequisites identified	• Past students • Potential students • Peer designers • One-to-one trials	• Increased fidelity between learning tasks and the performance objectives • Adjusted prerequisite tasks

Fig. 3.13 Sample formative evaluation summary

Prerequisites	• Insufficient for middle goals	• Past students • Potential students • Peer designers • One-to-one trials	• Added prerequisites • Adjusted prerequisites
Instructional Strategies	• Practically all activities confined to within the walls of a physical classroom	• Past students • Potential students • One-to-one trials • Small group trials	• Replaced several in-class activities with out-of-class activities
Testing Methods	• Mostly paper and pencil exercises	• One-to-one trials • Small group trials • Field trials	• Incorporated more kinesthetic activities
Information to Guide the Leather	• Designed more for instructor-led course while the course is actually delivered online	• Subject matter expert • Small group trials • Students	• Changed the Table of Contents to a <i>Site Map</i>
Information to Guide the Facilitator	• Designed for an experienced instructor while novice instructors are likely to be the teachers	• Peer designers • Small group trials • Field trials	• Added more directions for the teacher • Added more supplemental resources
Supporting Media	• Authentic items caused planned instruction to exceed budgeted cost	• Media experts • Small group trials • Peer designers • Project manager	• Revised corresponding objective • Revised corresponding test item • Substituted 20% of genuine items with simulated artifacts

Fig. 3.13 (continued)

Practice Opportunity Practice your knowledge and skills about *Summarizing Formative Revision Data* completing the table in Fig. 3.14 and using the content from the Firefighter Case in Appendix A.

Practice Case
Summary of Formative Revisions Template

Component	Problem	Data Source	Revision Decision
Purpose			
Goals			
Objectives			
Prerequisites			
Instructional Strategies			
Testing Methods			
Information to Guide the Learner			
Information to Guide the Facilitator			
Supporting Media			

Fig. 3.14 Template for providing formative evaluation summary data

Closure Provide a summary of the revisions made prior to implementation.

Conduct a Pilot Test

Objective Undertake a Field Trial for credit as the final stage of the formative evaluation stage.

You Should That the results of the one-to-one trials were used to revise the learning resources in preparation for the small group trials.

Already Know The results of the small group trials were used to revise the learning resources in preparation for the field trials.

The results of any non-credit-bearing field trials were used to revise the learning resources prior to conducting a Pilot Test.

Content Introduction

Because ADDIE is an iterative process (nonlinear), the topic of Evaluation reasserts itself, once again, into the process. Evaluation in ADDIE can be defined as collecting data about how students learn specific content under varying instructional conditions, analyzing those data, and synthesizing the data into meaningful information that can be used to make decisions about the process and the instructional products.

Formative Evaluation is the process of collecting data that can be used to *revise* the instruction *before implementation*, thus making the instruction more effective. A *Pilot Test* is an example of Formative Evaluation.

Summative Evaluation is the process of collecting data following implementation (of at least one training class/event) in order to determine its effectiveness (how well it satisfies the instructional goals).

Students who participate in the Pilot Test are expected to meet all of the objectives in the instruction. Therefore, Pilot Test participants receive credit and are not expected to repeat the course.

Procedure for Conducting a Pilot Test

- a. The students in the Pilot Course should represent the exact same group of students for which the course was designed.
- b. A facilitator should lead the instruction from the identified facilitator group. (The designer should not play this role; the designer should observe the process.)

- c. The client (or person who has the final decision as to the recommendation for implementation) should observe the Pilot Test.

Data Collection

Like the small group trial, data are collected on learner achievement and attitude, instructor procedures and attitudes, and resources such as time, space, and equipment. Data are supplied from the following sources:

- Pilot instructor debriefings
- Observation
- Participant interviews
- Embedded test scores
- Post-test scores

Data Analysis

The collected data should be grouped across learners, and then displayed graphically such as through an instructional analysis diagram or concept map. It should reflect an overall picture of the instruction, organized by objective. Summarizing the data in this format helps to locate areas where the instruction was not effective.

Formative Revisions

Any revisions prior to implementation should be based on the data collected as well as your own experience in the instructional systems design process. You may notice some minor problems during the Pilot Test that other observers, less sophisticated in the instructional systems design process, don't. Using reliable learning principles, make any final adjustments before implementation.

Evaluation Team

Those who participate in the evaluation consist of the following:

- Instructional development group
- External review panel
- Representative from management

The evaluation team generates a Pilot Test Report.

Role of Management

It must be remembered that one of the main purposes of the Pilot Test is to determine whether to proceed with implementation of the instruction as planned. Whatever the instructional development group or evaluation team recommends, it must be remembered that management renders the final adoption decision.

Components of a Pilot Test Plan

To implement a Pilot Test, you would first prepare a Pilot Test Plan. The typical components of a Pilot Test Plan include

- Participant Description
- Prerequisites
- Location, Date, Time
- Learning Environment
- Facilitator Qualifications
- Measurement Plan
- Evaluation Team Description

Participant Description

Describe the total number of participants in the proposed Pilot Test, number of groups of participants, and any defining characteristics such as specific occupations.

Prerequisites

Describe the prerequisites that the learners are expected to bring with them to the instruction.

Location, Date, Time

Describe the location where the Pilot Test will take place. Provide the length of time for which the instruction is scheduled and dates when each module will be piloted.

Learning Environment

Describe the learning environment for which the Pilot Test is planned including technological and institutional resources required.

Facilitator Qualifications

Describe the qualifications needed by the facilitator.

Measurement Plan

Describe what you will measure and how it will be measured. Include a copy of the measurement instruments you will use including debrief questions.

Evaluation Team Description

List the Evaluation Team members. Describe each person's role and responsibilities.

Result: Learning Resources

The result of the Develop phase is selected Learning Resources. Common learning resources available or developed by the end of this phase are:

1. Lesson plans
2. Sources for additional content
3. Instructional strategies
4. Selected media to facilitate the learning process
5. A comprehensive set of directions that will offer guidance to the teacher as he or she interacts with the students during the course of the planned instruction
6. A comprehensive set of directions for each instructional episode and independent activities that facilitate the student's construction of knowledge and skills
7. A summary of significant revisions
8. The results of a pilot test

During the meeting where the Learning Resources are presented to the client, usually one of two things happen: (A) the client requests additional formative evaluation data or (B) the client is satisfied. If the client request additional formative evaluation data, repeat the necessary components of the design and develop phases, and prepare a revised formative evaluation summary and revised learning resources as appropriate. If the client is satisfied, then obtain the appropriate endorsements and proceed to the Implement phase.