

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 1

Analyze

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Abstract The purpose of the Analyze phase is to identify the probable causes for a performance gap. Upon completion of the Analyze phase, you should be able to determine *if* instruction will close the performance gap, propose degree to which instruction will close the gap, and recommend strategies to close the performance gap based on empirical evidence about the potential for success. While instruction can influence the performance of students, employees, and other learners, there are many other factors that influence performance and become valid alternatives to instruction, such as filling an information void, providing appropriate documentation, crafting effective job aids, providing timely feedback, delegating authority, reengineering a product or process, reorganizing a work unit, and clarifying consequences of poor performance; therefore, if the performance gap is caused by reasons other than a lack of knowledge and skill, then *stop* the ADDIE process. If the performance gap is caused by a lack of knowledge and skill, then proceed to propose instructional options. During the client meeting where the Analysis Summary is delivered, usually one of two things happen: (A) the client requests changes to the analysis or (B) the client is satisfied. If the client request changes, repeat the Analyze phase or relevant parts of the Analysis phase and prepare a revised Analysis Summary document.

Keywords Analyze · Analysis · Performance assessment · Performance gap · Client · Instruction · Instructional design

Introduction to Analyze Phase

The purpose of the Analyze phase is to identify the probable causes for a performance gap. The common procedures associated with the Analyze phase are as follows:

1. Validate the Performance Gap
2. Determine Instructional Goals
3. Analyze Learners
4. Audit Available Resources
5. Recommend Potential Delivery Systems (including cost estimates)
6. Compose a Project Management Plan

Upon completion of the Analyze phase, you should be able to

- a. Determine *if* instruction will close the performance gap
- b. Propose degree to which instruction will close the gap
- c. Recommend strategies to close the performance gap based on empirical evidence about the potential for success

If the performance gap is caused by reasons other than a lack of knowledge and skill, then *stop* the ADDIE process. While instruction can influence the performance of students, employees, and other learners, there are many other factors that influence performance and become valid alternatives to instruction, such as filling an information void, providing appropriate documentation, crafting effective job aids, providing timely feedback, delegating authority, reengineering a product or process, reorganizing a work unit, and clarifying consequences of poor performance. An example of filling an information void is when an employee might not perform because the manager never communicated relevant information to the employee. An example of providing appropriate documentation occurs when the written process the employee was to follow was faulty, not the person. We need to change the written process and not train the person to get the desired results. An example of crafting effective job aids is that when a task that is performed rarely and is readily available to the employee when needed would be a better solution than a full training program. An example of providing timely feedback is if an employee has no feedback on how he or she is performing, then he or she may not perform a job when necessary, or may perform the job inadequately. Giving the employee proper feedback may produce the desired results. An example of delegating authority is that the employee does not think he has permission to do the task and therefore doesn't perform even when he or she has the skill to complete the job. An example of reengineering a product or process may be the setup of the work unit interfering with performance. Training won't solve this situation. An example of reorganizing a work unit is when an employee placed within one business unit, but reporting to another business unit will likely perform his or her job properly once moved into the correct business unit. An example of clarifying consequences of poor performance occurs if there

is no consequence for doing the job wrong. Even if the person is trained, he or she may continue to do the job incorrectly because he or she perceives that it doesn't make any difference whether or not the job is done correctly.

If the performance gap is caused by a lack of knowledge and skill, then proceed to propose instructional options and develop a *Purpose Statement*. The result of this phase is an Analysis Summary. Common components of an Analysis Summary are as follows:

1. Performance Assessment
2. Purpose Statement
3. List of Instructional Goals
4. Learner Analysis
5. Required Resources
6. Potential Delivery Systems (including cost estimates)
7. Project Management Plan

During the client meeting where the Analysis Summary is delivered, usually one of two things happen: (A) the client requests changes to the analysis or (B) the client is satisfied. If the client request changes, repeat the Analyze phase or relevant parts of the Analysis phase and prepare a revised Analysis Summary document. If the client is satisfied, then obtain the appropriate endorsements and proceed to the Design Phase. The remainder of this chapter is devoted to the common procedures of the Analyze phase.

Validate the Performance Gap

Objective	Generate a purpose statement based on a defined performance gap.
You Should Already Know	The concepts associated with each of the five ADDIE phases.
Content	Instructional designers are often requested to develop instruction for knowledge people already possess or skills people can already perform. The purpose of instructional design is to generate instruction where a lack of knowledge and skill exists. Therefore, the initial step in the instructional design process is to analyze the reasons for a performance gap. A Performance Assessment reveals the reasons or causes for performance gaps.

Sample Performance Discrepancies

- A. A computer program upgrade with a new user interface has just been installed in the work place. There is a

significant decrease in productivity. Therefore, a performance discrepancy exists.

- B. A hybrid automobile has been added to the fleet of vehicles at the university. The automotive technicians at the university responsible for the proper functioning of the new hybrid vehicles have never maintained or repaired the new cars. Therefore, a discrepancy exists between the auto technician's current skills with maintaining the older gasoline only cars and the knowledge and skills required for maintaining the newer hybrid cars. Therefore, a performance discrepancy exists.
- C. Multiple errors have been found in the Accounting Department's handling of paychecks. Therefore, a performance discrepancy exists.

The three main steps for conducting a performance assessment are

- 1. measure the Actual Performance
- 2. confirm the Desired Performance
- 3. identify the causes for the performance gap

Step 1. Measure the Actual Performance

- A. Observe
- B. Test
- C. Interview
 - i. top performers
 - ii. subject matter experts
 - iii. novice performers
 - iv. supervisors
- D. Gather data from
 - i. standards
 - ii. surveys
 - iii. occurrence reports
 - iv. error reports
 - v. awards and recognition criteria

Step 2. Confirm the Desired Performance

- A. Observe
- E. Test
- F. Interview
 - i. top performers
 - ii. subject matter experts
 - iii. novice performers
 - iv. supervisors

G. Gather data from

- i. standards
- ii. surveys
- iii. occurrence reports
- iv. error reports
- v. awards and recognition criteria

Step 3. Identify the Causes for the Performance Gap

Once the extent of the Performance Gap has been determined, the next step is to identify the primary cause of the gap. Practically all causes for a performance discrepancy can be categorized as one of the following:

- A. Lack of Resources
 - B. Lack of Motivation
 - C. Lack of Knowledge and Skill
- (see Fig. 1.1)

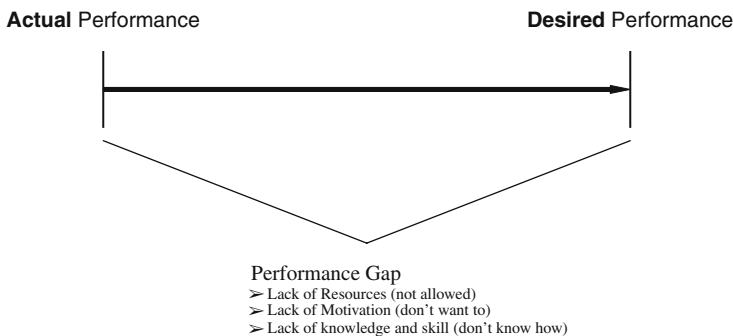


Fig. 1.1 Three main causes for a performance gap

1. Lack of Resources (not allowed)

Performance gaps caused by a lack of resources indicate that someone is motivated to perform the desired task, but the resources are unavailable to perform the desired tasks. Lack of resources are commonly associated with:

Limited Technology Capacity (Insufficient support)

The person could do the work if he or she had the resources available, such as knowing how to complete a desired computer task, but the person can't accomplish the desired performance because he or she doesn't have access to a computer.

Limited Cognitive Capacity (Not able)

The person is not capable of performing the work no matter how much training he or she receives, such as an excellent student who continues to fail quantum physics, regardless of the effort.

Limited Process Capacity (Doesn't work)

The process that the person is following to complete the task is flawed, such as requiring a person to follow a set of procedures that omit necessary components of the process. Thus, increasing capacity may be the best response to a performance gap in the case of lack of resources, rather than instruction.

2. Lack of Motivation (don't want to)

Performance discrepancies caused by a lack of motivation indicate someone has the capacity to perform the desired task, but chooses otherwise. The person is “unwilling” to perform the task. There can be several reasons for apparent lack of motivation, for example

- a. a media specialist may not have received clear expectations about the need for the task
- b. a student may not have received feedback or coaching from his or her teacher
- c. a teacher might be told to perform a task but received greater financial incentives for performing other tasks instead
- d. an individual may have been punished for a previous performance, such as being the only manager who saves thousands of dollars in his budget and becomes the only one who gets his budget reduced the following year
- e. an employee may have never received communication about the need for the task, although he or she could perform the task to the desired level if he or she was aware of the need

Thus, motivating an individual to perform desired tasks might be the best response to a performance gap in the case of lack of motivation, rather than instruction.

3. Lack of Knowledge and Skill (Don't Know How)

Performance gaps caused by a lack of knowledge and skill indicate an individual has the resources to perform the desired task and the individual is willing to perform the desired task; however, the intellectual skill or psychomotor skill to perform as desired is not evident. Thus, instruction may be the best response to a

performance gap in the case of lack of knowledge and skill. The results of a performance assessment typically indicate that the performance gap has multiple causes. This may require a need to modify the original scope of the performance gap or several non-instructional responses are more appropriate than invoking the ADDIE paradigm. Often, there will be a need for multiple responses to a performance gap, and those responses may need to occur simultaneously.

Sample Performance Assessment

The Maintenance Services Division of Big Box Stores, a national retail business solicited bids for a training development project. An instructional design group responded to the request for proposals. The training request indicated several instances of intermittent malfunctioning store escalators causing minor injuries to store patrons. The team conducted a performance analysis. The team interviewed stakeholders from all levels of the company. A total of 80 people participated in the performance analysis. The results of the 80 people surveyed and review of company records are presented in the following Performance Assessment chart (Fig. 1.2).

<i>Actual Performance</i>	<i>Desired Performance</i>	<i>Primary Cause</i>	<i>Percent of the Performance Gap</i>
31% identified and located the proper service entry panels	Identify and locate all service entry panels on all models of escalators	1. Rarely informed about part recalls 2. Unclear about personnel responsible for managing procedural updates 3. Spanish is the preferred language of communication for the majority of the maintenance staff	20%
34% identified when to move an escalator to “out-of-service” status even when it appears to be functioning properly	Move escalator to “out of service” before there is a potential for injury due to improper operation	1. Rarely is preventative maintenance performed	30%
21% identified the correct procedures to identify warning signs of potential malfunction	Anticipate malfunctions	1. Unaware of expenses associated with malfunctioning escalator that led to personal injury 2. No one assesses performance prior to the malfunction of an escalator	25%

Fig. 1.2 Sample performance assessment chart

87% failed to correctly identify the procedure for anticipating a malfunction, properly move to “out of service,” perform proper service and return to safe service	Anticipate a malfunction, properly move to “out of service,” perform proper service, and return to safe service	1. Posted information is often inconsistent with the actual escalator mechanism 2. Maintenance personnel are often trained on escalators that are different from the actual escalators encountered on the job	25%
Total = 100%			
Purpose Statement	The purpose of this training program is to present effective strategies for the safe and efficient maintenance of the escalators at Big Box Stores		

Fig. 1.2 (continued)

Practice Opportunity

Compose a preliminary draft of a performance assessment (Fig. 1.3) for the Firefighter Case located in Appendix A.

Performance Assessment			
Actual Performance	Desired Performance	Primary Cause	% of Total Performance Gap
Purpose Statement			

Fig. 1.3 Performance assessment summary template

Purpose Statement

The Validate the Performance Gap procedure is summarized in a *Purpose Statement*. The purpose of the *Purpose Statement* is to state in succinct and explicit terms the primary function of

the instructional program and the context in which the instruction will occur. Develop a *Purpose Statement* after you have determined that instruction is a viable option for closing a portion of the performance discrepancy.

Guidelines for Composing a Purpose Statement

- 1. Expressed in terms of what the teacher function will accomplish.
- 2. Use plain language rather than jargon. A client or non-training professional ought to comprehend the overall goal of the proposed instruction.
- 3. Show the connection between the instruction and the business need for the training.
- 4. Limited to 25 words. More details about the context or situation can follow in subsequent content as part of an introduction.

Practice Opportunity	Write a <i>Purpose Statement</i> for the <i>Firefighter Case</i> located in Appendix A.

Closure	Support recommendations with empirical evidence. Consider the different types of learning that will be needed to achieve the purpose.
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Determine Instructional Goals

Objective	Generate goals that respond to performance gaps that are caused by a lack of knowledge and skill.
You Should Already Know	The three most common causes of a performance gap.
Content	A goal is defined as the end toward which all effort is directed. A description of a broad expectation. There are many origins for goals. However, goals should be statements rather than questions in the ADDIE approach to instructional design. Effective goals are the result of a shared decision-making

process, situated within some context, a reflection of some reality, valid and authentic. Sample goal statements are the following:

- a. Write a novel
- b. Travel to another country
- c. Generate collaborative living environments
- d. Get married
- e. Build a house

Instructional goals describe the “terminal” tasks that students will perform at the end of the course. They answer the question, “What will students be able to do as a result of participating in this course?” While goals infer performance, they *do not* specify the criteria (standards) for the performance nor the conditions under which the performance should be demonstrated.

Here are some examples of instructional goals:

- a. “Identify the essential components of guided learning.”
- b. “Compose a research report worthy of publication.”
- c. “Apply an interactive planning process to the development of learning resources.”
- d. “Analyze learning.”
- e. “Synthesize a proposal to develop instruction.”
- f. “Evaluate learning resources and development processes.”

Most learning requires a progression from known to unknown, and from simple to complex. Learning is also organized by cognitive domains such as Bloom’s Taxonomy (Fig. 1.4). Indeed, the learner would need to remember information (have basic *knowledge*), interpret information or predict consequences or effects (*comprehend* information), use learned material in new and concrete situations (*apply* the rules, methods, concepts, principles, laws, or theories), see the parts of a situation and the patterns that have been formed (*analyze*, separate, and explain the meanings), put parts together to form a new whole (such as *synthesize* a research proposal), judge the value of material for a given purpose (*evaluate* a statement, novel, research report, training project).

Bloom’s Taxonomy

Competence	Skills Demonstrated
Knowledge	• Observation and recall of information • Knowledge of dates, events, places • Knowledge of major ideas • Mastery of subject matter <i>Question Cues:</i> list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
Comprehension	• Understanding information • Grasp meaning • Translate knowledge into new context • Interpret facts, compare, contrast • Order, group, infer causes • Predict consequences <i>Question Cues:</i> summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend
Application	• Use information • Use methods, concepts, theories in new situations • Solve problems using required skills or knowledge <i>Question Cues:</i> apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover
Analysis	• Seeing patterns • Organization of parts • Recognition of hidden meanings • Identification of components <i>Question Cues:</i> analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer

Fig. 1.4 Adapted from Bloom, B.S. (Ed.) (1956) Taxonomy of educational objectives: The classification of educational goals: Handbook I, cognitive domain. New York; Toronto: Longmans, Green

Synthesis	• Use old ideas to create new ones • Generalize from given facts • Relate knowledge from several areas • Predict, draw conclusions <i>Question Cues:</i> combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite
Evaluation	• Compare and discriminate between ideas • Assess value of theories, presentations • Make choices based on reasoned argument • Verify value of evidence • Recognize subjectivity <i>Question Cues:</i> assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize

Fig. 1.4 (continued)

Please be advised that there will be a desire to use words to generate goal statements that are practically impossible to measure, but seem intuitive such as “know,” “understand,” and “learn.” However, avoid these and similar words in performance-based learning environments (Fig. 1.5). Instructional Goals are valuable for describing the training project to the client during the Analysis Summary. Because instructional goals can be sequenced, they are also used in the Design phase to organize the remainder of the ADDIE process.

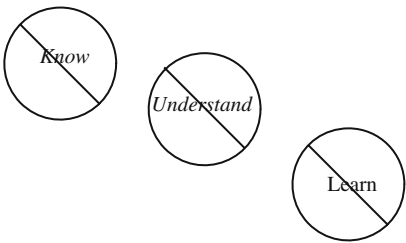


Fig. 1.5 These words are *not* acceptable when generating instructional goal statements

Practice Opportunity Use the Worksheet in Fig. 1.6 to apply what you’ve learned about *Generating Instructional Goals* to the situation described in the Firefighter Case located in Appendix A.

Determine Instructional Goals

Write your list of Instructional Goals below.

1.

2.

3.

4.

5.

6.

Fig. 1.6. Worksheet to practice composing instructional goals

Closure

Consider the different types of learning that will be needed to achieve the instructional goals. Consider the prerequisite knowledge and skills required to start toward the instructional goals. Consider the abilities, capabilities, experiences, preferences, and availability of the learners for whom the goals are intended.

Confirm the Intended Audience

Objective	Identify the abilities, experiences, preferences, and motivation of the student audience.
You Should Already Know	That the purpose of this ADDIE project will be devoted to closing performance gaps caused by a lack of knowledge and skills.
Content	One of the most important tasks that you will complete during the Analyze phase is to collect data that assist you in confirming the members of the intended student audience. The data that you collect will impact decisions throughout the remaining ADDIE processes. The types of data include but are not limited to a. Group identifications b. General characteristics c. Numbers of students

- d. Location of students
- e. Experience levels
- f. Student Attitudes
- g. Skills that impact potential to succeed in the learning environment

Group Identifications

The first step is to identify the group or groups of learners who will become the students. This task is where you certify whether there is one group of learners or there are multiple groups of learners. After you have identified the learner groups, reconfirm that the group who will participate in the training is the *same* group whose performance you already assessed. You may need to reconfirm your performance gap analysis if the learner group is different from the one identified as having a performance gap.

General Characteristics

Next, describe the general characteristics of the learner group. Some of the characteristics you should determine include are average age, gender distribution, average level of education, cultural makeup, and language proficiencies. You will use this information for all subsequent phases of the ADDIE process. For example, the selection of exercises and examples used in the course may depend on the age of the group. Naming teams after the latest rock groups will not work well with the over 50 crowd while it may bring a sense of excitement to those under the age of 30. In the same way, utilizing the example of John Kennedy's oratory skills in a presentation skills class may be a stellar example for the over 50 age group; the skills of Barack Obama may be a more current example for those under 30.

Numbers of Students

The number of students should be determined. Consider the total number of students, the number of *different* audience groups *per class*, the number of learners per class, especially if such parameters already exist.

Location of Students

The location of the learning environment should be determined. Determine whether the students travel to a central location or whether the teacher travels to the location of the students.

Experience Levels

The experience of the students should be determined relative to the knowledge and skills that will be acquired prior to the development of any instructional materials. It is important to know what the student already knows and can do before she or he engages others within the learning environment. The average number of years of experience in a professional position or the number of years in school immediately preceding the course being designed can provide a clue to the current level of knowledge and skill that students will bring to the class, but that information may not be adequate. Also examine turnover rates and current level of knowledge and skills. You may have determined current performance levels when completing the performance assessment or you may need to re-examine the information you acquired and move to a deeper level of detail now.

Attitudes

It is extremely valuable to discover the attitude of the students who will likely interact with the instructional materials and instructional strategies. Things in the current political or economic climate such as current union negotiations may impact the learning environments; therefore, it is important to ascertain the current attitude a student may have toward her or his work or school surroundings. It is also prudent to determine the current attitude of a student toward her or his job. Things such as recent promotions or performance reviews may impact a student's current attitude. Even the student's attitude toward various types of learning environments can affect her or his attitude toward the planned instruction. Things such as a student's self-assessment of skills prior to a course may impact her or his current attitude.

Skills that Impact Potential to Succeed in the Learning Environment

Students can't improve their skills if they can't fully participate in the instructional experience. For example, if the instruction requires students to use Lotus Notes and the students are not fluent in Lotus Notes, the course will have little chance of success. Therefore, the prerequisite knowledge and skills the student must have related to the type of Delivery should be part of the Analyze phase. Use this phase to determine if there are any prerequisite skills the students should have to participate fully in the learning environment, such as the need for specific computer skills necessary or the need for particular language proficiencies.

Practice Opportunity

The data presented in the Sample Case in Fig. 1.7 are minimally acceptable at best. Certainly additional data and information about the students would increase the potential of the ADDIE process to close the performance gap for the causes related to knowledge and skills. Scrutinize the Learner Analysis for the *Sample Case* in Fig. 1.7. Consider ways to improve the data summary.

Sample Case: Escalator Maintenance**Learner Analysis*****Primary Student Group***

The student audience is approximately 560 escalator technicians throughout the company's operations in North America.

General Characteristics

The average age of these employees is 28; the age range is from 22 to 66. All have at least a high school diploma or equivalent. Only 32% were educated in English-speaking countries. Of the remaining 68%, most speak Spanish as their primary language. The gender breakdown of these employees is 65% female.

Numbers of Students

Based on a projected annual 20% turnover rate (of the current employees), an additional 112 technicians will need to be trained by this same time next year.

Location of Students

The company has decided that all training will occur at their 10 regional hubs in North America.

Experience Levels

Average time on the job is less than 2.5 years.

Student Attitudes

Continued employment is the prime motivation; meeting goals, including the elimination of personal injuries during a technician's work shift, is key to continued employment. These employees are apprehensive about job security and are overextended due to staff cutbacks and re-assignments. They are generally uncomfortable using computers and are slow to accept new methods.

Skills That Impact Potential to Succeed in the Learning Environment

Training methods that do not require computer usage may be most beneficial. Lessons presented in Spanish may be advantageous for the majority of these employees.

Fig. 1.7 Example of a minimally acceptable learner analysis

Practice Opportunity Apply what you’ve learned about *Conducting a Learner Analysis* (Fig. 1.8) to the situation described in the *Firefighter Case* in Appendix A.

Firefighter Case

Learner Analysis

Primary Student Group

General Characteristics

Numbers of Students

Location of Students

Experience Levels

Student Attitudes

Skills That Impact Potential to Succeed in the Learning Environment

Fig. 1.8 Learner Analysis template

Closure Confirm that you have identified the abilities, experiences, preferences and motivation of the student audience. Present the results in terms of the facts, rather than opinions.

Identify Required Resources

Objective	Identify all types of resources that will be required to complete the entire ADDIE process.
You Should Already Know	1. The purpose of the ADDIE project 2. The instructional goals 3. The general characteristics of the intended students
Content	Four Common Resource Types There are four types of Resources that should be audited: 1. Content Resources 2. Technology Resources 3. Instructional Facilities 4. Human Resources

Content Resources

Pre-existing resources may be available that contain valuable content. These resources could then be used as references for content, as references for learning strategies, as parts used in the learning environment without alteration, and as parts used only for illustration or examples.

Technology Resources

It is important to evaluate the available technology that is available for the learning environment. As you identify the available technology resources, keep in mind the number of computers available, if applicable, and any other electronic devices that will be required for hands-on activities. It is also important to identify non-digital technology that will be required to complete the entire ADDIE process, such as flip charts, writing utensils, dry marker boards, easels and, adhesive notepads.

Instructional Facilities

Instructional Facilities include things such as rooms available per location, the number of rooms required for the duration of the ADDIE process, the number of students that can be

accommodated per room, and any peculiar scheduling that should be considered around special times of the day and special dates of the year.

Human Resources

Human Resources that impact the design, development, and implementation of the learning environment need to be identified. Consider the number of teachers, trainers, and facilitators that will need to be available to fully develop, implement, and evaluate the instruction. Consider the level of expertise each teacher, trainer, and facilitator will bring to the ADDIE process. Identify the need for coaches and managers to provide continuous support throughout the ADDIE process, particularly the Implement and Evaluate phases. Generate a database of relevant names and contact information of subject matter experts and other stakeholders related to the project.

Practice Opportunity

Scrutinize the Resource Audit for the *Sample Case* in Fig. 1.9 and recommend improvements.

Resource Audit for the Sample Case: Escalator Maintenance

Content	Technology	Facilities	Human
• Diagrams for escalator schematics near the service panels • Manuals with step-by-step descriptions of the safe operation have been located • Mock-ups are available at each learning facility of three primary types of escalators installed at Big Box Stores	• VCRs and monitors are available in all training locations • Mock-ups can be utilized for practice • Operational escalators can be utilized in all identified training locations • Video Production services has been contacted concerning a preliminary discussion and offered their participation • Flip charts and pens are available in all locations. One per room • White boards, pens, and erasers are in each teaching room in adequate numbers	• Training rooms that can accommodate the technology resources required have been identified • Up to 20 learners can be accommodated in each room at a time • The rooms are available to be reserved for the entire days of each date of the training session	• Spanish-speaking facilitators have been identified; however, their schedules will need to be carefully coordinated for implementation due to heavy demand for their services. No other experience is necessary. A train-the-trainer can provide the necessary expertise and a detailed Facilitator Guide will be produced. • Two subject matter experts have been identified to assist with the course development

Fig. 1.9 Sample resource audit

Practice Opportunity

Apply what you’ve learned about *Conducting a Resource Audit* to the content from the *Firefighter Case* located in Appendix A.

Resource Audit for the Firefighter case

Content	Technology	Facilities	Human

Closure

Summarize all of the resources required to complete all of the phases of the ADDIE process. Present the results to the client in terms of the facts, rather than opinions.

Determine Potential Delivery System

Objective	Determine the potential delivery system and the estimated cost.
You Should Already Know	1. The purpose of the ADDIE project 2. The instructional goals 3. The general characteristics of the intended students 4. The resources required to complete the entire ADDIE process
Content	The next procedure in the Analyze phase is to evaluate different instructional delivery systems and recommend the best option(s) that has the greatest potential to close the performance gap. Common delivery systems include a. Physical Face-to-Face Meetings b. Computer-based Training c. Video d. Internet-based Learning Management Systems e. Blended (two or more of the above)

Each delivery system has advantages and disadvantages. The selection of delivery system should depend on how well the alternative contributes to the attainment of the training outcome desired. For example, using computer-based training would be ideal for hands-on practice in developing skills needed for using a new computer software program. Students in classroom without computer equipment would be less likely to attain the outcome desired.

Each recommended delivery option should include an estimate of the potential costs involved. While estimated costs can be projected, actual costs will be calculated for each of the ADDIE phases as each phase is completed. A systematic process is used to estimate the total cost for each potential delivery system.

Nine-Step Estimation Procedure

1. Identify the delivery options under consideration
2. Estimate the length of time for each delivery option under consideration
3. Compute cost for the *Analyze Phase* [actual]
4. Estimate cost for the *Design Phase*
5. Estimate cost for the *Develop Phase*

6. Estimate cost for the *Implement Phase*
7. Estimate cost for the *Evaluate Phase*
8. Total the estimated costs for all five ADDIE phases
9. Provide an estimated cost range (see Fig. 1.10 below for a sample of an estimated cost worksheet)

Determine Potential Delivery System (including cost estimate)
Sample Case: Escalator Maintenance

Step 1. Identify the delivery options under consideration.

Example

Option A: Classroom

Option B: Video and classroom combined

Step 2. Estimate the length of time for each delivery option under consideration

Example

Option A: 2 h

Option B: Classroom: 2 h including 15 min of video

Step 3. Estimate Analysis Costs

Compute the actual expenses in completing the Analysis and add to Cost Estimate Worksheet.

Example

Hours: 40 @ \$55/h (designer cost) = \$2200

Designer Total: \$2200

Double the total (other costs such as time of those interviewed): \$4400

Step 4. Estimate Design Costs

- 1) Calculate the Designer's time using the following guidelines:

Classroom training: Use 1 Day of Designer time per day classroom training

CBT: Use 1 day of Designer time per finished 5 min of CBT time

Video: Use 1 day of Designer time per finished 10 min of video time

- 2) Multiply the estimated time by \$55/h

*Example***Option A**

2 h Classroom training = 1 day Designer time

1 day (4 h) $\times$ \$55/h = \$220

Option B

2 h Classroom training = 1 day Designer time

15 min video = 1 day designer time

2 days (16 h) $\times$ \$55 h = \$880

Step 5. Estimate Development Costs

- 1) Calculate the Developer's time using the following guidelines:
 - Classroom training: Use 2 Days of Development time per finished hour of classroom training (This will include Desktop Publishing of the manuals and development of slides)
 - CBT: Use 3.5 days of Development time per finished 5 min of CBT time
 - Video: Use 1 day of Development time per finished 10 min of video time for scripting
- 2) Multiply the estimated time by \$55/h
- 3) Add production costs using the following guidelines:
 - Classroom manuals: Use \$10 per manual
 - Video: Use \$1000 per finished minute

*Example***Option A**

1) 2 h classroom training = 4 days development time

2) 4 days (32 h) $\times$ \$55/h = \$880

3) 560 Manuals @\$10 per manual = \$5600

Option B

1) 2 h classroom training = 2 days development time

5 min of video = 1.5 days scripting development time

2) 5.5 days (44 h) $\times$ \$55/h = \$2420

3) 560 Manuals @\$10 per manual (\$5600) plus 15 min of Video @ \$1000/min (\$15,000) = \$20,600

Step 6. Estimate Implementation Costs**1) Calculate the Facilitator Costs**

1. Calculate the # of Facilitators needed
2. Multiply by # of hours each will facilitate
3. Multiply the Total hours by \$55/h
4. Add travel/accommodation costs

Example

Option A:

1. Calculate the # of Facilitators needed (83 classes)
2. Multiply by # of hours each will facilitate: 83×3 (1 h clean up) = Total Instructor Hours (249)
3. Multiply the Total Hours by \$55/h = \$13,695
4. Add travel/accommodation costs (\$3000) = \$16,695

2) Calculate the Learner's Costs

1. Calculate the # of Learners $\times$ number of class hours
2. Multiply by average salary
3. Estimate total travel costs per person
4. Total the Learner Costs

Example

Option A

1. Calculate the # of Learners $\times$ number of class hours: $560 \times 2 = 1,120$
2. Multiply by average salary: $1120 \times \$15/h = \$16,800$
3. Estimate total travel costs per person: 0
4. Total the Learner Costs: \$17,920

3) Add #1 and #2 together to obtain Implementation Costs: \$34,616**Step 7. Estimate Evaluation Costs**

For estimation purposes, use the same figure for Evaluation Costs that was calculated for Analysis Costs. Evaluation Costs = \$4400. Add this figure to the chart on the next page.

Step 8. Total the estimated costs for each of the five ADDIE phases.

Option A: \$76,595

Option B: \$94,795

Step 9. Provide an estimated cost range (+ or -20%)		
	Option A	Option B
Estimated costs + 20%	\$91,914	\$113,754
Estimated costs -20%:	\$62,076	\$75,836
Estimated Costs are	\$62,000-\$92,000	\$76,000-\$114,000

Sample Case: Escalator Maintenance Training		
	Option A	Option B
Analyze Phase	\$4400	\$4400
Design Phase	\$220	\$880
Develop Phase		
Development	\$880	\$2420
Production	\$12,500	\$27,500
Implement Phase	\$54,195	\$55,195
Evaluate Phase	\$4400	\$4400
Total	\$76,595	\$94,795
Estimated costs	\$62,000-\$92,000	\$76,000-\$114,000

Fig. 1.10 Estimated costs for the sample case

Practice Opportunity

Apply what you’ve learned about *Estimating Costs* (Fig. 1.11) to the content from the *Firefighter Case* located in Appendix A.

Sample Case: Firefighter Case		
	Option A	Option B
Analyze Phase	\$	\$
Design Phase	\$	\$
Develop Phase Development Production	\$ \$	\$ \$
Implement Phase	\$	\$
Evaluate Phase	\$	\$
Total	\$	\$
Estimated costs	\$ - \$	\$ - \$

Fig. 1.11 Estimated costs template for the Firefighter case

Closure The client will use the cost estimates of the potential delivery systems to determine which option she or he chooses to move from the Analyze phase to the Design phase.

Compose a Project Management Plan

- Objective**

Create a consensual document that confirms the expectations of all parties involved in the project.
- You Should Already Know**

1. The purpose of the ADDIE project

2. The instructional goals

3. The general characteristics of the intended students

4. The resources required to complete the entire ADDIE process

5. The potential delivery systems and general cost estimates
- Content**

Two rules of project management:

1. A project has a beginning, middle, and an end

2. A project is measured in terms of quality, time, and money

A project is a “temporary endeavor undertaken to accomplish a unique product or service” (PMBOK® Guide 2000, p. 4). A project’s purpose is unique, temporary, requires resources from a variety of domains, and typically has a primary

sponsor or client. Understanding these two rules of project management is essential to effective project management for practically any community.

The Project Management Institute (PMI) defines four major project phases: initiation, planning, execution, and closure. One could make the case that almost every project goes through these four phases. Within these phases are smaller gradations. Some methodologies suggest decomposing projects into phases, stages, activities, tasks, and steps. Cost and schedule estimates, plans, requirements, and specifications should be updated and evaluated at the end of each phase, sometimes before deciding whether to continue with the project. Large projects are usually structured to have major program reviews at the conclusion of significant project phases.

Consider the following sections of a project management plan:

1. *Core Instructional Design Team Members*

Identify members of the project team and stakeholders. Document the organization of project.

2. *Significant Constraints*

The constraints describe the conditions or capabilities that must be met or possessed by the products of the project to satisfy a contract, specification, or other formally imposed standard. The constraints identify the project boundaries by stating what is included within the project as well as what is excluded from the project. Project constraints list and describe the specific project constraints associated with the project scope that limits the team's options.

3. *Schedule Tasks*

Scheduling is the timing and sequence of tasks within a project. A schedule consists mainly of tasks, task dependencies, durations, constraints, and time-oriented project information. A task is part of a set of actions which accomplish a job; the sense is that useful work is getting done. Duration is defined as a limited or specific period of time during which something happens, lasts, or extends. Constraints are defined as the act of limiting or condition of being limited. These are all key terms when dealing with scheduling. See Fig. 1.1 for additional terms related to scheduling tasks.

4. *Final Report*

Many lessons will have been learned by the end of the project. Some of your ideas will have succeeded while other ideas will have failed. You may wish that you had

2. Significant Constraints

The constraints describe the conditions or capabilities that must be met or possessed by the ADDIE products to satisfy a contract, specification, or other formally imposed standard. The constraints identify the boundaries by stating what is expected within the ADDIE project as well as what is excluded from the ADDIE project. Project constraints list and describe the specific project constraints associated with the project scope that limits the team’s options. What are some constraints for the Firefighter Case?

3. Schedule Tasks

Sketch a Gantt chart that indicates the main tasks and primary deliverables for the Firefighter Case. Keep your Gantt chart simple. A horizontal bar chart will suffice at this point (see Fig. 1.12).

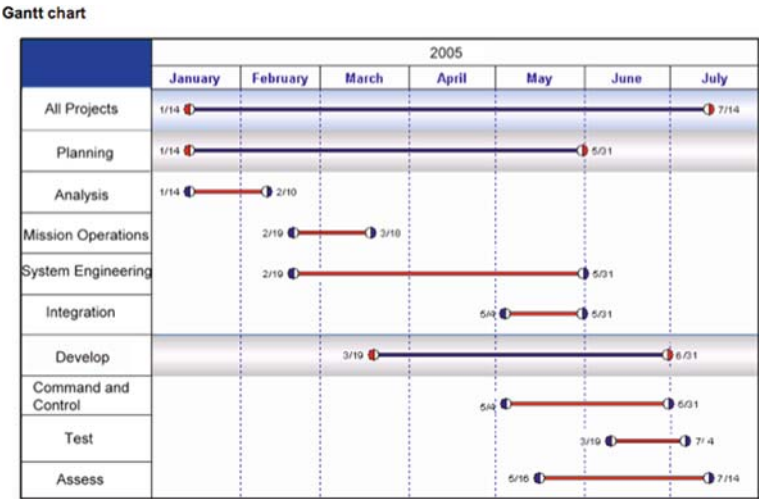


Fig. 1.12. Sample Gantt chart

4. Final Report

A project ends by focusing on the future. A report that documents the history of a project facilitates the ending process. This is a post-implementation activity and provides a summary of activities during the ADDIE process. This post-implementation report also contains recommendations

for future projects of similar scope. The Final Report often includes, but is not limited to, items such as

1. Project team organization, including staffing and skills
2. Schedules
3. Successful risk assessment and mitigation actions taken
4. Processes used for change control, quality, and configuration management
5. Communication protocols used throughout the project
6. Techniques for managing stakeholder expectations
7. Success factors and how they were met
8. Financial data
9. Recommendations to future project managers
10. Lessons learned

Closure Confirm the expectations of all of the main stakeholders before your team begins to earnestly consume resources. Document the expectations vis a vis a project plan or work strategy document. Acquire written endorsements prior to initiating the next phases of the ADDIE approach to instructional design.

Result: Analysis Summary

The result of the Analyze phase is an *Analysis Summary*. Common components of an Analysis Summary are as follows:

1. A Performance Assessment Report
2. A Purpose Statement
3. A List of Instructional Goals
4. A Student Profile
5. A List of Required Resources
6. Potential Delivery Systems (including cost estimates)
7. A Project Management Plan

During the client meeting where the Analysis Summary is delivered, usually one of two things happen: (A) the client requests changes to the analysis or (B) the client is satisfied. If the client request changes, repeat the Analyze phase or relevant parts of the Analyze phase and prepare a revised Analysis Summary document. If the client is satisfied, then obtain the appropriate endorsements and proceed to the Design phase.