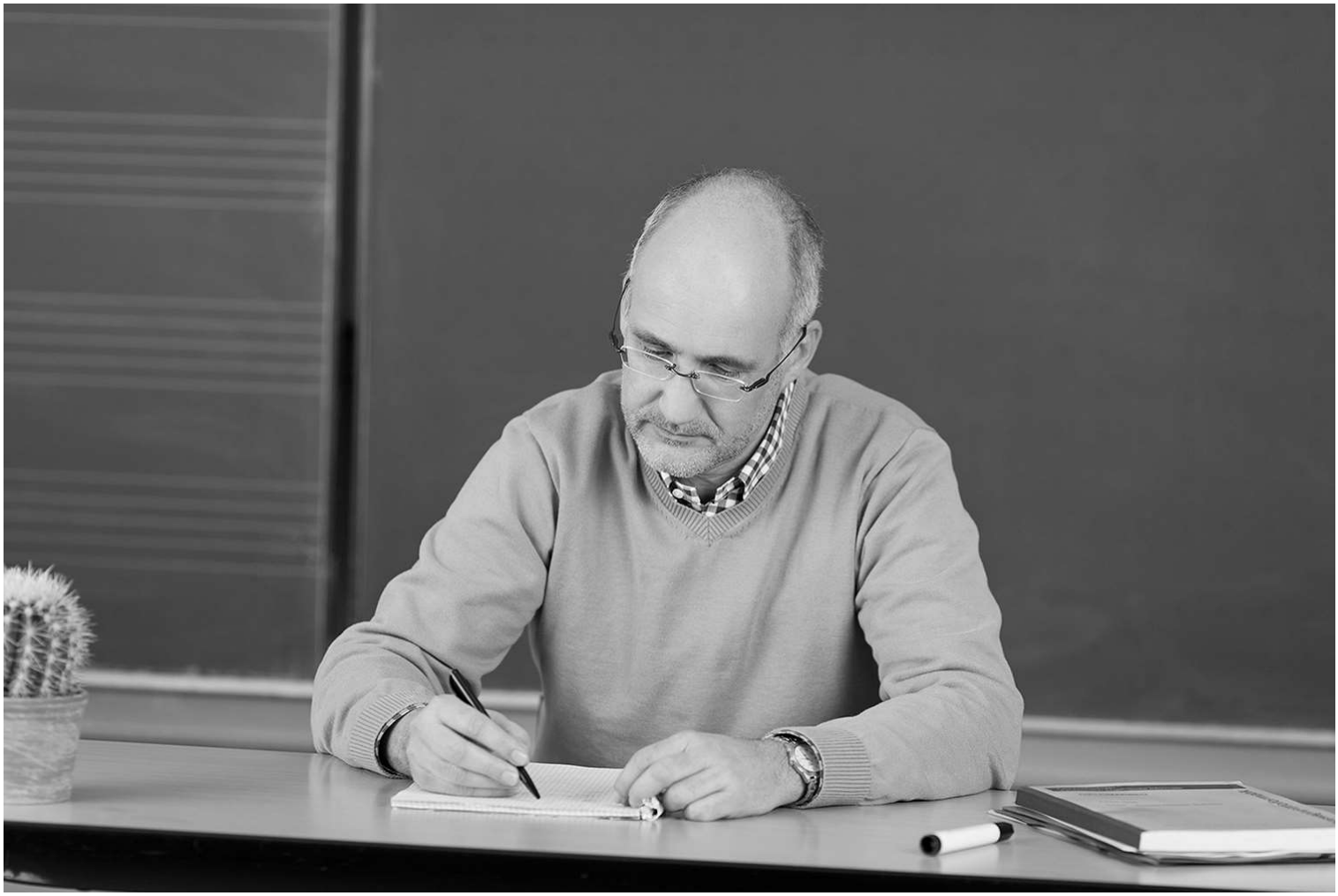
Chapter 5

Learner Analysis



"I don't know how I'm going to make this work!" exclaimed Alice after receiving an assignment to create a web-based course on dealing with harassment in the workplace. "Everyone in the company—from senior executives to new hires in the mailroom—is supposed to take this course. How am I supposed to design something that is appropriate for everyone?"

Alice is aware of the company's need for the instruction, and she knows the tasks necessary to complete the instruction. What she is having trouble with is finding a way to design the instruction that is appropriate for her audience—an audience that consists of a great many people, all of whom have different levels of skill and experience.

Meanwhile, across town at Washington Middle School, David is developing lessons for the upcoming school year's oceanography unit. David will have over 70 middle school students in his classes, and although he knows they are all similar in age and educational background, David recognizes that each is a unique individual. David asks himself, "How do I present lessons that everyone will consider interesting and engaging?"

Alice and David both need to conduct a learner analysis, and each one needs to decide on the best learner analysis approach for his or her situation.

Guiding Questions

- What does an instructional designer need to know about the learners for whom he or she is creating instruction?
- How does one determine the common attributes of a group of learners?
- What common attributes among a group of learners are most important to determine for purposes of designing instruction?
- How does one organize the data collected about the learners into a format that is useful?
- How can one determine if a learner analysis is accurate?

Key Terms

changing differences (page 92)
changing similarities (page 92)
diagnostic teaching (page 84)
entry competencies (page 91)
learner characteristics (page 84)
learner-centered environments (page 84)
learning styles (page 86)
member check (page 95)
motivation (page 86)
stable differences (page 92)
stable similarities (page 91)
universal design for education (page 87)

Chapter Overview

A corollary activity to task analysis is learner analysis. Determining the learners' approach to the instruction—including prerequisite knowledge, skills and attitude toward the task—is an important part of effective design and development. This chapter describes various methods of determining and articulating learner predispositions, knowledge, and skills. Approaches taken by a variety of instructional design experts are presented and explained. This chapter also offers suggestions for formatting the data gathered in order to make it useful during the design and development of the instruction and recommends methods of evaluating the effectiveness of a learner analysis.

Analyzing Learners

There is not much point to creating an instructional intervention that the intended audience cannot or will not use. Understanding the target audience of learners and determining in advance what they can and will do is an essential element of any instructional plan. In order to gain understanding of the target audience, one must conduct some form of preliminary evaluation of that group. Learner analysis is considered a critically important component of the instructional design process.

There was a time when the majority of educators perceived the learner as an "empty vessel." The learner was without knowledge, and teaching was considered the act of "filling up" students with facts, procedures, and concepts. This approach has long since fallen into disfavor; most educators now perceive learners as individuals who come to each instructional situation with a variety of background experiences that affect the new experience. To appropriately prepare instruction requires consideration of the learners' prior knowledge, abilities, point of view, and perceived needs.

Bransford, Brown, and Cocking (2000) describe the importance of "*learner-centered environments*" where careful attention is given to the skills, knowledge, beliefs, and attitudes that learners bring to an instructional situation. This fits well with the concept of "*diagnostic teaching*" (Bell, O'Brien, & Shiu, 1980), which approaches instructional problems through the development of a thorough understanding of the conceptual and cultural knowledge students bring with them to the educational environment.

Just about everyone would agree that instructional design requires some understanding of the learner, but actually gaining that understanding through a trustworthy, reliable process can be a challenge. There is no single, correct

method of learner analysis that every instructional designer uses. However, the goal of every type of learner analysis is the same: to understand and interpret learner characteristics in a way that helps in the design of effective instruction.

Gagne, Wager, Golas, and Keller (2005) explain goals of learner analysis as a rational approach to reducing the vast number of individual learner characteristics to a single set of general characteristics that make instructional planning feasible through the identification of common learner characteristics that have a direct impact on the instructional design and the range of learners' experiences and abilities that will affect the learning results. In other words, a learner analysis identifies the critically important general traits of a group as well as identifying the range of skills and talents within that group that are relevant to the instructional situation.

Some aspects of learner analysis are easily quantifiable, and gathering this data is a relatively simple matter. For example, it is not difficult to accurately determine physical characteristics such as age or gender. However, cultural and psychological information can be far more difficult to define accurately. Furthermore, the target audience itself, that is, the group of learners participating in the instruction, may vary considerably; Ort (2014) points out that in modern corporate settings, groups that range in age from their twenties ("Millenials") to their mid-sixties ("Baby Boomers") are common. "Generation Z" is comprised of those who were born around 2000/2001 and are recognized as a group with predilections unique to their own generation (Schulten, 2018). We the authors find similar differences among learners in higher-education settings and Childress and Benson (2014) observe that students in K-12 classrooms may be similar in age and educational background, but they may range widely in achievement and preparedness.

While it is important to carefully consider the cultural and psychological aspects of the target audience, the number of variables involved in determining in advance precisely what will be "culturally appropriate" or "psychologically optimal" instruction are beyond our current control. The most thorough learner analysis is still a matter of taking a "best guess" at how the instruction should be designed to work efficiently and effectively for the target audience.

There are a number of theoretical constructs and recommended practices that can help an instructional designer conduct the best possible learner analysis. Approaching the task by making use of these constructs and practices can significantly improve the chances of determining what type of instruction will work for the target audience.

Human Needs

Before looking at the intended audience as a group of learners, it is a good idea to recognize them as a group of *human beings.* Basic human wants and needs must be addressed before any instructional intervention is attempted. While it is not the instructional designer's role to provide for each of these needs, it is in everyone's best interest to be at least familiar with how to gauge an individual or group's instructional readiness at this most essential level.

One of the most popular theoretical constructions to address the issue of human needs is Maslow's *hierarchy of needs* (Maslow, 1968). Maslow's theory assumes that at any given time, a person's behavior is determined by his or her needs. The hierarchy of needs is typically depicted as a pyramid that has at its base the general physiological comforts, such as hunger and thirst. Once these bodily comforts are met, one may address the more abstract needs of knowledge, aesthetics, and self-fulfillment. At its pinnacle, Maslow's hierarchy (see Figure 5.1) places the ability to help others find self-fulfillment (transcendence) (Orlich, Harder, Trevisan, Brown, & Miller, 2018).

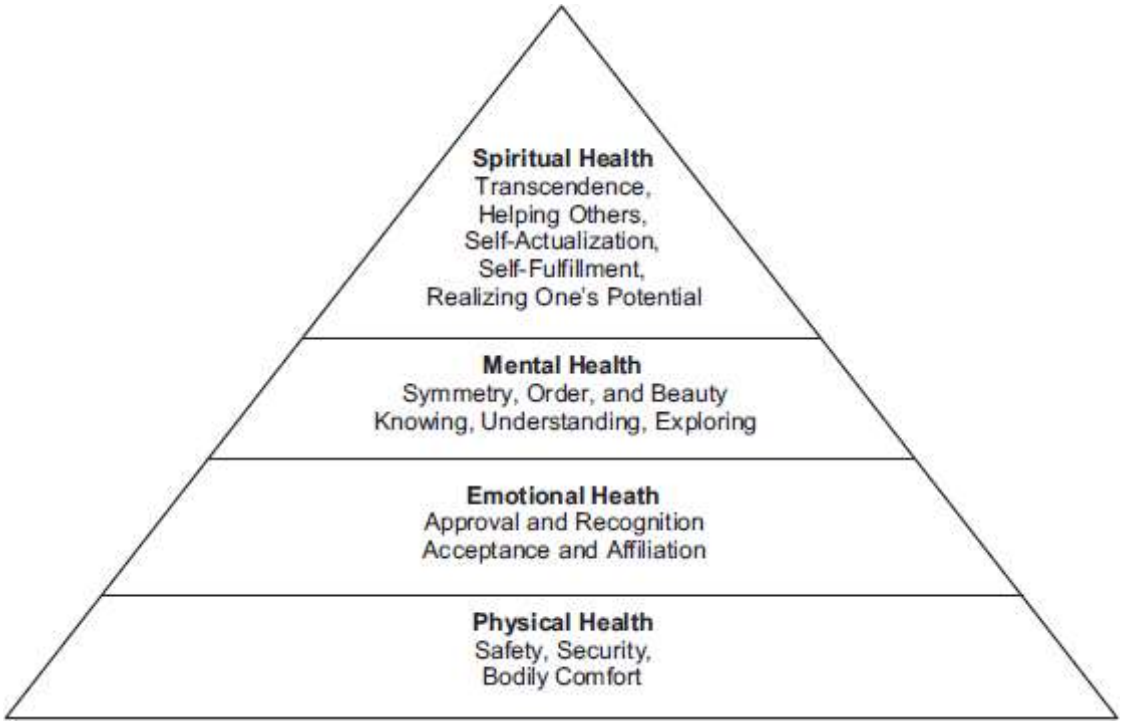


Figure 5.1 Maslow's Hierarchy of Needs

Source: Adapted from Maslow, A.H. (1968). *Motivation and personality*. New York: D. Van Nostrand.

An example of addressing the needs of the learner according to Maslow's hierarchy would be ensuring that learners are not particularly hungry when they participate in instruction (in schools, this may be addressed through a free lunch or breakfast program; in a corporate setting, this may be addressed by providing snacks or a meal as part of the instructional event). Once it has been established that the intended audience's needs are met to a point where they are ready to receive instruction, the designer must determine what content the learners are prepared for and how best to deliver that content to keep all participants active and interested.

Captive Audience or Willing Volunteers?

For any instructional activity, participants can be divided into two categories: "captive audiences" or "willing volunteers." Captive audiences are those people who receive a mandate to receive the instruction developed (for example, in the United States, children are required to attend school; they are a captive audience). Willing volunteers participate in the instructional activity because they are motivated to do so without a mandate—taking courses for pleasure or pursuing an advanced degree are most often instructional activities in which individuals choose to participate. It is important to distinguish between captive audiences and willing volunteers because the two groups can behave very differently toward the instruction presented. One almost never hears an adult who has chosen to take a course in painting at a local community college ask, "Why are we doing this?" while grade-school pupils in a state-mandated mathematics class ask that question quite often. Determining and acknowledging the learners' motivations and obligations to participate in the developed instruction can greatly improve its effectiveness.

Motivation is a complicated subject that deserves continued study; here, we will discuss only its basic elements. Motivation can be essentially divided into two classes: intrinsic and extrinsic. If learners enjoy the instruction for its own sake and take pleasure in the activity, the motivation is said to be intrinsic. If learners participate in the instruction because they anticipate some reward beyond the instruction itself (for example, they are paid or completing the instruction allows them to do something they truly enjoy), the motivation is said to be extrinsic (Malone & Lepper, 1987). The question that must be answered while conducting a learner analysis is, "What motivates the target audience to participate in this instruction?" Determining what makes the students participate can help shape the presentation of the instruction in a way that learners will find most acceptable and appealing.

Learning Styles

Learning styles has been a hot topic among educators. The basic premise is that all individuals can approach learning challenges in a different way, but these approaches are not necessarily idiosyncratic; they can be categorized into common "styles." In his work on educational innovation research, Arthur Ellis (2005) explains that most people who advocate focusing on learning styles stress the idea that everyone receives and processes information differently; therefore, teachers should try to know how each of their students learn best. According to learning styles advocates, a problem arises if only one or a few forms of presentation are used for instruction (for example, using only lectures) because this favors those students with an auditory learning style. Equally capable students who have differing learning styles may not be getting as much out of instruction that addresses only one learning style.

Popular instruments of learning styles assessment include the Myers-Briggs Type Indicator, the Learning Styles Inventory, the Sternberg-Wagner Self-Assessment Inventories, and the Embedded Figures Test (Ellis, 2005).

At present, there is little evidence that designing instruction to meet the specific learning styles of individuals increases academic achievement (Ellis, 2005). However, awareness that learners comprehend information differently should remind anyone responsible for designing instruction to provide a number of activities that stimulate learners' thinking in a variety of different ways.

Universal Design for Education

Universal design for education or universal design for learning is an outgrowth of the universal design movements in architecture (Curry, 2003; Howard, 2003). Federal legislation, including the Architectural Barriers Act of 1968 and the Americans with Disabilities Act of 1990, supports a universal design approach that makes all situations accessible to the widest possible variety of learners. Taking into consideration that physical and intellectual ability, cultural and ethnic background, and socioeconomic status can affect how people perceive and process information, the universal design for education movement seeks to create environments and instructional contexts that provide equal access to the resources necessary for academic success (Curry, 2003).

> When schools introduce universal design, student diversity becomes a powerful component of the education environment. But implementing the universal design framework goes beyond accommodating individual learners. Because it makes education environments seamlessly and inherently functional for almost all students, universal design minimizes the need for individual accommodations.
>
> (Curry, 2003, pp. 56–57)

It is important to keep in mind that universal design for education is not only about accommodating learners who are mentally or physically disabled, but it is also about providing appropriate activities and challenges for gifted and talented students. Universal design for education strives to provide appropriate instructional opportunities for all learners in a way that goes beyond attaching "add-on" activities after the instructional design is completed (Howard, 2003). Instructional designers must be aware of the needs of diverse learners and plan activities that welcome meaningful participation by all members of the target audience. Following the principles of universal design for education can help make the planning process easier and the final product more efficient and effective for all participants.

User-Centered Design

Specialists in Human Computer Interaction (HCI) often discuss the need for a user-centered design approach. The essential premise of user-centered design is that learner (or user) analysis should be an ongoing activity throughout the process of designing and developing software. Consideration for the characteristics of the end user must be a part of the designer's thinking from beginning to end, "gathering, analyzing and specifying user personas, their tasks, their work environment, and usability and [user interface] requirements" (Seffah, 2003). An essential part of user-centered design is usability testing. Put simply, usability testing is an analysis method whereby observers watch individuals or groups use the product to complete a set of prescribed tasks. The problems the subjects encounter in completing the tasks indicate where product revision needs to occur.

Baek, Cagiltay, Boling, and Frick (2008) point out that user-centered design can be viewed as either product-oriented or process-oriented. With a product-oriented approach, the designer may view his or her task as that of creating a specific, fixed product others will use as-is once it is released. With a process-oriented approach, the

designer may view his or her task "in the context of human learning, work, and communication" (Baek et al., 2008); the development of the product is then the result of a series of revisions based on end-user feedback.

> I remember watching a group of graduate students design an interactive kiosk display. In the prototype, a little bell sound accompanied the "next" button that took one to a new screen. During usability testing, it became obvious the bell sound was not helpful; the team observed that many of the end-users assumed the bell indicated some problem and they stopped using the software as soon as they heard the bell. Fixing this problem made the final product far more "usable" and effective.
>
> Abbie Brown

User-centered design is intended as a way of looking at the entire software development process in terms of the end user instead of in terms of the programmer or the machine. Keeping the end user in mind is the key to learner analysis. A user-centered design approach is often useful for designing instruction in general and learner analysis in particular.

Among its many advantages, user-centered design helps avoid a common mistake: that of "teaching as you were taught." When faced with designing instruction for the first time, people often develop and implement lessons based on their memory of how they were taught ("I'm going to give a lecture because that is how my teachers taught me"). There are good intentions behind this approach, but the designer is assuming that his or her own learning experience was the best one possible, and that the learners will appreciate the approach just as he or she did. This is the opposite of a user-centered approach; it is *designer-centered*. It is possible that the way the designer was taught is the best approach for the situation, but that should only be determined by careful analysis, and "It worked for me" is not a careful analysis. User-centered design, and learner analysis in general, causes the instructional designer to focus on the target population of learners and helps to develop plans that work for that population.

Alice ponders how best to approach her learner analysis. She does not have to worry about her learners' basic needs because the instruction is online and learners will engage with it at their convenience. However, the group is radically disparate in terms of age, education, and experience. Alice is determined to find a learner analysis approach that will help her create instruction that everyone finds effective and appealing.

David continues to consider how best to present instruction to his middle school students. They are all similar in age and education, they all have to work together during a specific class time, and they all need to feel safe and secure within the school setting. However, David recognizes his students are also unique and different from each other. Determining how these differences affect his instructional design is critically important to him.

Popular Approaches to Analyzing Learners

A number of respected instructional design scholars have addressed the issue of learner analysis. The elements that are common to and unique among these approaches are worth examining as you begin to develop your own learner analysis methodology.

Robert F. Mager is an author of instructional design texts that have been popular for decades. His approach to learner analysis is a good place to start. Mager (1988) recommends the following procedure.

1. Begin with the realization that a learner analysis is a working document that will not be published or seen by anyone other than yourself and perhaps other members of the instructional design team. It is not necessary to organize the content into specific categories.
2. Write down everything you think you know about the target audience. If it seems challenging to get started, begin with trigger questions, such as: why are they taking this course? Do they want to be in this course? What training and experience do they have in relation to the subject matter?
3. Describe the range of characteristics whenever possible.

A few critically important things to do when conducting a learner analysis include: take care to describe the learners as they are, not as you would like them to be; describe people, not institutions or policies; describe the differences among the learners as well as the similarities; remember that you are creating a working document that can be amended during the development process (Mager, 1988).

Mager (1988, p. 60) recommends analyzing and articulating the following about the target audience.

1. Age range.
2. Sex distribution.

3. Nature and range of educational background.
4. Reason(s) for attending the course.
5. Attitude(s) about course attendance.
6. Biases, prejudices, and beliefs.
7. Typical hobbies and other spare time activities.
8. Interests in life other than hobbies.
9. Need-gratifiers (rewards that would work).
10. Physical characteristics.
11. Reading ability.
12. Terminology or topics to be avoided.
13. Organizational membership.
14. Specific prerequisite and entry-level skills already learned.

A common approach to the problem of learner analysis is to "ask the students themselves" by generating and distributing a survey or questionnaire. However, Mager asserts that questionnaires are *not* a useful source of information about the target audience:

> Questionnaires are not a useful source of information about your students. Why izzat, you may wonder? It's because it takes a great deal of skill and time to prepare a questionnaire that will elicit the type of information you may want. Items have to be drafted, and they absolutely must be tested and then revised, and maybe tested again, before one can have any assurance at all that the questionnaire will work. And people with this specialized skill are rare. If they are skilled in questionnaire development, they are not likely to be working in a training department.
>
> (1988, p. 59)

Mager's statement about questionnaires is open to debate. Powerful arguments can be developed for and against the use of questionnaires. It is important for instructional designers to consider the potential problems and benefits of this popular strategy.

Professionals in Practice

Our instruction falls into one of two broad categories: instructor-led training (delivered either remotely or in a classroom setting) and self-paced web-based training using either virtual machines in a lab environment, or multimedia authored web-based training modules. For instructor-led training, high-level concepts are delivered by human instructors. Media include PowerPoint presentations and whiteboarding at the instructor's discretion. We introduce a concept, discuss it, perhaps demonstrate it, and then we go to a hands-on lab as quickly as we can. "Get them into a lab ASAP" is a rule of thumb. Millennials in particular tend to zone out after about ten minutes.

Students follow along in a MS Word-based student guide, which complements the PowerPoint presentation (but does not reproduce each slide) and also contains the formal lab exercises. I use the scaffolding method in my materials: early in the class, lab steps are explicitly prescribed, and expected outcomes are stated. Later in the class, the scaffolding is pulled away: lab steps that have been done several times before are no longer explicitly prescribed, but expected outcomes are still stated. We want participants to understand why something is being done instead of just "show me how to do it." The writing style in the labs employs strategically placed questions that force participants to stop and think about cause, effect, and likely outcomes while they are working.

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Smaldino, Lowther, and Russell (2012) take a different approach. They suggest that the learner analysis should focus on three aspects of the target audience: general characteristics, specific entry competencies, and learning styles.

- *General characteristics*. Demographic information, such as the learners' ages, physical abilities, or socioeconomic status; the learner's cultural identification or shared values; and the amount of previous experience with the content to be covered can all help the designer make informed decisions about how to prepare and deliver the instruction.
- *Specific entry competencies*. Prior knowledge that is necessary for learners to succeed with the instruction is critically important to the success of any instructional design project (for example, there is not much point to

creating instruction on how to conduct research on the web if the target audience does not know how to use a mouse).

- *Learning styles*. The psychological predilections of individuals affect what they find to be attractive and effective instruction. Gardner's (1993) aspects of intelligence (verbal/linguistic; logical/mathematical; visual/spatial; musical/rhythmic; bodily/kinesthetic; interpersonal; naturalist and existentialist) and Gregorc's "mind styles" (Butler, 1986) (concrete-sequential, concrete-random, abstract-sequential, and abstract-random) are examples of explanations of how people prefer to approach and deal with problem-solving and instruction. Knowledge of these preferences may help the designer create instruction that is easily understood and accepted by the target audience.

Dick, Carey, and Carey (2015) list the following as useful information for instructional designers about the target population.

- Entry skills (similar to Smaldino, Lowther, and Russell's entry competencies).
- Prior knowledge of topic area.
- Attitudes toward content and potential delivery system.
- Academic motivation.
- Educational and ability levels.
- General learning preferences.
- Attitudes toward the training organization.
- Group characteristics.

Two items from this list—*attitudes toward content and potential delivery system* and *attitudes toward the training organization*—are important reminders to take into consideration the impressions and prejudices that the learners may have about the instructional content, the method of instruction, and the group providing the instruction. These impressions can have a tremendous impact on the effectiveness of the instruction. Furthermore, it is possible to improve the learners' receptiveness to the instruction by recognizing and addressing the learners' pre-existing attitudes either by capitalizing on positive impressions or addressing early on the concerns raised by negative impressions.

Smith and Ragan (2005) approach learner analysis by suggesting that the designer categorize learners by their stable and changing similarities and differences.

- *Stable similarities*. Learners are generally "configured" similarly (the eyes and ears are located in the same location—as are legs and arms—and the vast majority of learners convert oxygen to carbon dioxide through respiration). Perhaps more important to an instructional designer is knowledge of the perceptual similarities among human beings. For example, human beings can only see what is in their field of vision, and the eyes come with a mechanism for blocking out visual stimuli altogether (the eyelid); however, human hearing is not something that needs to be directed (there is no "field of hearing"; we hear everything around us whether or not we direct our attention toward the noise) nor can humans block hearing (there is no "ear-lid"). As another example, healthy human vision systems can read static text (this is called "scanning"), and they can follow movement within their field of vision (this is called "tracking"), but they cannot do both at the same time (although the vision system can switch between these two tasks in microseconds, which coincidentally causes considerable fatigue). The way human vision works is something anyone designing instructional multimedia should take into consideration.
- *Stable differences*. Any group of learners can be divided into subgroups that are inherently different from the larger group. These differences may be physical (such as gender or age), psychological (including differing learning styles and levels of intelligence), or psychosocial (Smith and Ragan describe these as personality traits that affect one's performance in a learning environment).
- *Changing similarities*. Certain types of human development have been studied extensively, and the observations made by researchers indicate that processes such as physical, intellectual, and language development are by and large the same for all people. For example, children develop physical dexterity more slowly than they do intellectual and language skills. Indeed, a typical 6-year-old can describe the activity of creating a toy parachute and can discuss why the parachute slows the descent of the object to which it is attached, but the child will probably not have the dexterity necessary to assemble the parachute. An instructional designer can use knowledge of human development to prepare lessons and activities that are most appropriate for the learner.

- *Changing differences*. Knowledge, values, skills, beliefs, and motivations change over time, and they combine uniquely for each individual. These changing differences may be the most difficult thing for an instructional designer to effectively prepare for. Nonetheless, it is important to recognize that a number of changing differences come into play when considering a group of learners.

Professionals in Practice

When I taught eighth-grade English, I would meet with the seventh-grade teachers each summer to learn about the students who would be entering my class in the fall. It was important to hear about individuals and the group as a whole in order to prepare coursework and activities. However, I knew the vast physical and emotional changes that many of the students would go through over the summer would alter both the individuals themselves as well as the group dynamic. I used the information the seventh-grade teachers provided while keeping in mind that the students I would meet in the fall would be three months older and would have had summer experiences that might change their values and perceptions.

—Abbie Brown former teacher at George Washington Middle School Ridgewood, New Jersey

Morrison, Ross, and Kemp (2010) approach learner analysis in a manner similar to Smaldino et al. (2012) by examining the learners' general characteristics, entry competencies, and learning styles.

Morrison, Ross, and Kemp recommend special attention be paid to the needs of culturally diverse learners as well as learners with disabilities. Designing with diverse learners in mind has become a popular topic in recent years. An approach that is gaining popularity is *universal design for education*, which plans for instruction by planning for the active participation of culturally and physically diverse learners.

Learner Analysis Procedures

All the approaches described previously have one thing in common: they stress the need to gather information about the target audience in order to create instruction that is effective, efficient, and appealing for that specific group. All the approaches point out that some types of data are more useful than others in determining appropriate instruction and recognize that even the most careful analysis is going to result in taking a "best guess" at the learners' skills and needs. Another element common to most learner analysis approaches is the recognition that members of any group are going to range in ability and interest. Keeping all this in mind, the instructional designer must create a useful working document that describes the target audience. There are numerous possibilities for creating such a document; two of these possibilities are as follows.

1. A chart of *learner characteristics* data.
2. A fictitious profile of the average member of the target audience.

Charting Learner Characteristics Data

This activity involves deciding what data to gather and creating a chart that illustrates the range of the learners' abilities (see Figure 5.2). Typically, instructional designers define the range by describing the *average* learner, the *challenged* learner, and the *gifted and talented* learner. An average learner can be defined as the typical participant—the person who is most similar to the largest portion of the target audience. The challenged learner can be defined as an individual who does not have all the entry competencies as the average learner; the challenged learner may also have some differing physical abilities or learning characteristics. The gifted and talented learner can be defined as an individual with exceptional skills or abilities in all or part of the instructional content; this person may have had more training in the area or may excel naturally.

Data Type	Challenged Learners	Average Learners	Gifted and Talented Learners
Reading Ability			
Maturity Level			
Mechanical Dexterity			

Figure 5.2 A Learner Ability Chart

Source: Author. The abilities listed were chosen from those described in Mager's and Morrison, Ross, and Kemp's approaches to learner analysis for purposes of illustration. The actual abilities chosen for a specific chart depend on the goal and context for the instruction.

Creating a Fictitious Profile of the Typical Learner

Another method of compiling the data gathered about the target audience is to create a fictitious profile of the "typical" member of the group. This requires a little creativity; the learner has to be created from the data provided plus some fictional elements (such as a name).

To fully develop a profile of the typical learner, consider what the learner might say about him or herself, what other people might say about him or her, and what performance evidence is available about the target audience (e.g., grades in previous courses or projects completed in other instructional settings). Researchers in the social sciences sometimes refer to comparing the perceptions and reports of different sources about the same subject as "triangulation." Triangulation is a very good way to develop a complete profile (see Figure 5.3).

Example learner profile:

Shirley is 24 years old with a bachelor's degree in liberal arts from a local university. She is married and has a toddler son, and she is concerned about spending too much time at work, away from her family. Shirley reads at a ninth-grade level (above average nationally; average for college graduates). She is a competent computer user and types about 60 words per minute...

Figure 5.3 A Learner Profile

Source: Author. The profile describes similar characteristics to those listed on the Learner Ability Chart, but there are some embellishments added to give the example personal characteristics that a designer can relate to on a very human level. Separate profiles can be created to describe challenged and gifted-and-talented learners.

Both charting and the creation of fictitious profiles have strengths and weaknesses. A chart is a handy reference that provides information at a glance, but charts tend to be a bit clinical and can lead to a less humanistic approach to designing instruction. Also, charts tend to imply that the information is perfectly reliable even though learner analysis is not an exact science.

On the other hand, profiles are far less clinical, creating a target human being to design for. However, the information is less readily accessible than a chart, and the creative embellishments may prove more distracting than productive. The job of the instructional designer is to find the right balance between clinical data and creative interpretation that works for the context of the assignment.

Evaluating the Success of a Learner Analysis

After conducting a learner analysis, how do you know that the results of the analysis are accurate? How do you know that the data gathered has helped to create the best possible instruction? The only sure way to know is to compare the learner analysis results with information on the students who participate in the instruction and listen to what students have to say about the instruction after they have completed it. This is an important summative evaluation activity that will help in determining the best course of action for subsequent learner analyses.

One way to evaluate the learner analysis during the design and development of the instruction (part of a formative evaluation) is to conduct a *member check*. A member check is a comparison method of evaluation; the interpretations drawn from the data gathered are shared with a peer who has similar experiences with developing instruction for a similar population. If the data and interpretations seem familiar and appropriate to the person with similar experiences, it suggests that the learner analysis was successful.

A member check can also be conducted with someone from the target audience. Asking a member of the target audience if the profile developed seems appropriate (essentially asking, "is this you?") can be very helpful in determining the success of the analysis.

Alice comes to a decision regarding her learner analysis approach. She knows that everyone in the company must complete the training, and the company employs people who vary widely in age, work experience, and education. She also recognizes that her learners are a "captive" audience (they are required to complete the harassment training), and the vast majority will be motivated extrinsically (they must complete the training to continue working for the company). Alice decides to take a universal design for education approach: she will identify members of the company who represent the range of learners and conduct regular member checks, asking the representatives to respond to draft versions of the instruction periodically as she develops the instruction. Alice also decides to use Smaldino, Lowther, and Russell's suggestion to focus on her learners' general characteristics—entry competencies and learning styles—to create instruction that can be used successfully by everyone in the company.

David has also come to a design decision. David knows his learners are a homogeneous group in terms of age and education, but they will vary in terms of ability. David recognizes that his learners are motivated both extrinsically and intrinsically (they are interested in learning, but grades are also a motivating factor). David understands that his learners are a "captive audience" because they are required to be in school, but many of them may see themselves as "willing volunteers" because school is an enjoyable and interesting activity. Because ability level is what varies most within his target audience, David has decided to chart learner characteristics data to determine how best to present lessons for average, challenged, and gifted and talented learners.

Learner Analysis and the Instructional Design Process

Conducting a learner analysis is a critically important part of the instructional design process. Regardless of the approach you take, completing a learner analysis should help you answer the following questions.

- Who is the intended audience for the instruction?
- What common traits do members of the learning group possess?
- What are the differences among learners within the group?
- What is the range of ability among the learners?
- What is the motivation for participating in the instructional event?
- Do the learners' have non-instructional needs (e.g., rest, food, safety) that must be met so that they may focus on the instructional activity?
- What will make the instruction effective, efficient, and appealing for the target audience of learners?
- How has the instructional designer or design team planned for the accommodation of culturally and physically diverse learners?
- What evaluation strategies will the instructional designer or design team use to determine the success of the learner analysis and how to refine future analyses for the instructional event?

Summary

Careful consideration of the target audience helps to ensure that the instructional design is effective and efficient for that audience. Learner analysis is a critically important component of any instructional design project. Although many educators once considered students to be "empty vessels" to fill with knowledge, the current perception is that students come to each instructional episode with their own skills, knowledge, and attitudes. There is no single,

correct method of learner analysis. Some learner data is easily quantifiable (e.g., age); some data is difficult to quantify (e.g., cultural perspective). Even the most thorough learner analysis is a matter of taking a "best guess" about the target audience, it is not possible to know precisely how the learners will react to new instruction. However, a number of theoretical constructs exist to help the instructional designer conduct an effective learner analysis. At the most basic level, the instructional designer can determine in advance if the learners' human needs are being met. The designer can also determine whether the learners are choosing to participate in the instruction or if they are under some obligation to do so. Popular approaches to learner analysis include those outlined by Mager; Smaldino, Lowther, and Russell; Dick, Carey, and Carey; Smith and Ragan; and Morrison, Ross, and Kemp. Most experts agree that it is important to consider the entire range of the target audience when conducting a learner analysis; the high-achieving and the challenged learners must be considered as well as the "average" learners. Two possible procedures for organizing learner analysis data are to create a chart of the data or to use the data to create a fictitious learner profile. Determining the accuracy and effectiveness of the learner analysis is an important evaluation activity in its own right. Comparing data and conclusions drawn with other educators who work with the same or similar populations is part of a formative evaluation. Gathering data about student reactions to the instruction (and interpreting that data) is an important summative evaluation activity.

Chapter Comprehension Questions

1. Currently, most educators perceive learners as individuals who come to each instructional situation with a variety of background experiences that affect the new experience.

    a. True.
    b. False.

2. An example of learner data that is relatively easy to gather is _____

    a. Cultural background.
    b. Gender.
    c. Psychological profile.
    d. None of the above.

3. Maslow's hierarchy of human needs is a theory that assumes that once bodily comforts are met, one may address _____.

    a. The more abstract needs of knowledge, aesthetics, and self-fulfillment.
    b. The more specific need of factual comprehension.
    c. The more general needs of cultural awareness.
    d. The varied needs of individuals within the group.

4. For any instructional activity, participants can be divided into two categories.

    a. Happy campers or grumpy geese.
    b. Sophisticates or neophytes.
    c. The few or the many.
    d. Captive audiences or willing volunteers.

5. Motivation can be divided into two classes.

    a. Acute and general.
    b. Transparent and opaque.
    c. Intrinsic and extrinsic.
    d. Grounded and elevated.

6. At present, there is little evidence that designing instruction to meet specific _____ of individuals increases academic achievement.

    a. Universal styles.
    b. Learning challenges.
    c. Learning styles.
    d. Universal challenges.

7. It is important to keep in mind that universal design for education is not only about accommodating learners who are mentally or physically disabled, but also about providing appropriate activities and challenges for _____ students.

    a. Culturally underrepresented.
    b. Ethnically isolated.
    c. Older and younger.
    d. Gifted and talented.

8. A user-centered design approach helps to avoid the common mistake of _____.

    a. Teaching as you were taught.
    b. Teaching to the top ten percent.
    c. Teaching to the average student.
    d. Teaching to the bottom ten percent.

9. Even the most careful learner analysis is going to result in taking a "best guess" at learners' skills and needs.

    a. True.
    b. False.

10. One way to evaluate the learner analysis during the design and development of instruction is to conduct a _____.

    a. System check.
    b. Member check.
    c. Instructor survey.
    d. System survey.

Connecting Process to Practice Activities

1. After reading about Alice's and David's instructional design challenges, do you think each of them made the right decision in how to approach a learner analysis for their respective projects? Explain why you think their approaches are appropriate or what you might do differently if you were in their positions.
2. Determine the entry competencies or skills necessary for learners receiving instruction on how to attach a file to an email message.
3. Create a fictitious profile for a typical learner in a college freshman expository writing course.
4. You are an instructional designer for a large corporation. How would you go about conducting a learner analysis for a new course on maintaining good customer relations that every sales representative will be required to take?
5. You are the instructional designer for a university library and have been assigned the task of creating computer-based instruction on how to find and retrieve journal articles from an electronic database that will be delivered via the web. What learner analysis processes will you use before you begin to design the instruction?
6. You have been asked to design instruction on the history of jazz music for a local senior citizens' center. What information about the learners would be most helpful to have before developing this instruction?
7. What general characteristics, entry competencies, and learning styles would you want to know about your learners before designing instruction on the proper method for taking a person's blood pressure?
8. Use the *charting learner characteristics data* strategy to predict the range of abilities for a group of 7- and 8-year-olds, elementary school students who require instruction on measuring and estimating length in inches, feet, centimeters, and meters.
9. Try conducting a small learner analysis on your own family or a group of friends. Assuming the entire group is going to learn how to prepare the pasta dish *fettuccini alfredo*, what are the similarities and differences among the group that must be accounted for in order to make the instruction effective, efficient, and appealing?

Recommended Reading

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