Chapter 5
Analyzing the Learning Environment

5.1 Introduction

A BBC headline caught my attention as I was reading articles and listening to the live news stream on my iPad over breakfast on April 11, 2013. The headline read: "Global PC Sales Tumble, Data Shows." The article noted that worldwide sales of PCs fell 14 % in the first quarter of 2013. Mikako Kitagawa, a principal analyst for the market analysis firm Gartner, was quoted as saying, "Consumers are migrating content consumption from PCs to other connected devices, such as tablets and smartphones" (BBC News, 2013).

The constructivist perspective on learning design emphasizes the inclusion of "real-world complexity" (see Chap. 4). I would argue that this real-world emphasis extends not only to the subject matter to be learned but also to the technology that mediates learning.

This chapter is the first of five that will disambiguate the ADDIE approach to learning design. The letters ADDIE compose an acronym for the learning design procedural sequence: analyze, design, develop, implement, and evaluate. The ADDIE model was developed in the 1970s, originally for military purposes, but over time has been generalized to provide a useful framework for most types of learning design.

5.2 The ADDIE Model

The ADDIE instructional design model was developed at Florida State University as a way for the military to design interservice training for individuals to do specific jobs as well as for overall training curriculum development (Branson et al., 1975). Today, some 40 years later, the ADDIE model has been tinkered with and generalized to the point that it has become a generic shorthand for learning designers.

The phases, or steps, of the model, represented in the acronym, can be summarized as follows:

Analyze. Gather information about students (needs, abilities, prior knowledge, interests, etc.), goals for learning, settings, contexts, and technology. In short, what factors are likely to influence, either positively or negatively, the shape of the learning design?

Design. Taking into account the factors discerned during analysis, the learning designer structures a framework for learning. This phase should answer questions such as: How will learning be acquired? What are the specific learning objectives? What kinds of activities will best accomplish the objectives? How can technology be used to mediate learning?

Develop. In this phase the design blueprint of the previous phase is actualized. Resources are assembled, lessons are delineated, and sequences are ordered.

Implement. Once the learning design has been developed, it is put into service. Students engage in learning, and the learning designer or teacher makes appropriate adjustments based on interactions, observations, and formative assessments, such a quizzes and student self-tests.

Evaluate. The final phase examines the learning design to judge its success. Student learning is part of this evaluation—in other words, did students learn the intended content? However, the focus of evaluation in this phase also is on the learning design itself. Did the learning design work smoothly? Was it efficient? Effective?

Ismail Ipek and colleagues (2008), in a study of trends and approaches to learning design, comment that today's instructional design models all include steps similar to the ADDIE model but add that "recently ID [instructional design] approach is effectively combined with the field of instructional technology" (p. 515). In practice this means that, in the context of tablet classrooms, technology-mediated learning factors must permeate all of the ADDIE phases.

5.3 Phase 1: Analysis

Learning design encompasses a broad spectrum of work, and individuals in this field aggregate under various titles, such as *learning designer, instructional designer, educational technologist, curriculum designer, learning architect, learning consultant, course developer, training and development specialist, program developer and manager*, *instructional technologist,* and of course *teacher.* In the emerging world of the tablet classroom the teacher is likely to be a principal learning designer.

Teachers, in fact, are, or should be, frontline learning designers, although teachers' work will be influenced by other learning designers (such as curriculum directors) and increasingly by would-be instructional designers (such as politicians and policy makers).

It is not an infrequent scenario as schools and districts implement 1:1 tablet technology for teachers to arrive in their classrooms on the opening day of school to find not only a sea of fresh-faced students but also a cartload of tablet computers, often with little prior training or practice with the new devices. So…what comes next?

In an ideal education environment, of course, teachers would have adequate training prior to being thrown into a tablet classroom. Most often this ideal is not realized, and training is sketchy at best. Consequently, effective teachers draw on both art and science to craft teaching and learning for their students, whether collectively or individually. If we compare effective teachers to jazz musicians, they must be exemplary players, more than merely technically competent. They know when to follow the score (the curriculum) and when to improvise. Teachers who aspire to be exemplary learning designers, especially in tablet classrooms, must be virtuosos.

To put learning design into a relevant context from outside the classroom, let's consider someone who works professionally in the field. Michael Shermis (2013) is a virtuoso learning designer. He is president of the consulting firm Story Insights (http://storyinsights.com) in Bloomington, Indiana. Shermis describes himself as a *story developer,* rather than a *learning designer*, but his company provides a variety of services, including learning design. His experience includes nearly 20 years of consulting with enterprises ranging from local nonprofits to international Fortune 500 companies.

According to Shermis, "A story is…about developing a mission, a vision, values, strategies, and much more." He explains, "Starting with what you do and where you want to be, your vision, and how you're going to try to get there and how you're going to treat people—you're developing a story. As I tell my clients, the people in the organization: You're the characters in the story. And it involves learning design all along the way."

How does that translate into designing learning for tablet classrooms? One approach, suggested by Shermis' story perspective, is for teachers to frame classroom learning design as the development of students' individual and collective stories.

A story turns on solving problems, according to Shermis. "A problem of some sort is at the heart of any story. How to solve the problem or problems is the lesson. The context makes it important to the learner, who wants to be successful." Shermis concludes by saying, "It begins with a lot of questions."

Isn't that true for any analysis? Michael Shermis' approach to learning design merges art and science to contextualize learning and make it real. Whether readers use this story framework or some other approach to learning design, the essentials of analysis as a first step are the same.

5.4 Using OPUS for Analysis

At the risk of adding yet another acronym to the alphabet soup that characterizes education lingo, I will nonetheless suggest OPUS as a mnemonic for observe, probe, unify, and stage. These four processes compose a useful, systematic, and relatively simple way to analyze the elements that every teacher must take into account when

designing learning. Earlier I compared teachers to jazz virtuosos. In music, as in literature (Shermis' story?), an opus is a creative work, often of special significance. Consequently, the acronym OPUS is appropriate for approaching an essential phase in the creation of effective learning designs for tablet classrooms. The acronym can be parsed as follows:

Observe. Any analysis of teaching and learning should begin with observation. It is easy to get off on the wrong foot when a teacher or other learning designer simply plunges in without taking time to see—really see—how students respond to topics and technology. In tablet classrooms it is equally important to observe both how students respond to subject matter and how they interact with devices. The former type of observation should be standard; the latter may be new to teachers and students just getting started in 1:1 tablet environments.

Many of today's students, even quite young ones, will be familiar with tablets or tablet-like devices. It's not unusual for parents and toddlers to play games, listen to music, or look at pictures and videos on handheld devices such as smartphones, iPods, and so on. Kindles, Nooks, and other e-readers provide a wealth of children's literature and have features similar to those found on tablet computers. From lap time onward, many children gain increasing familiarity and ease with handheld devices.

Even when students come into the tablet classroom with no prior device experience, it seldom takes long for them to become curious, first, and then adept at manipulating the basic features of tablets. Recall the account mentioned in Chap. 2 about the Ethiopian children who taught themselves to use tablet computers without any adult intervention (Associated Press, 2013). The point is that teachers should observe students carefully to gauge not only content knowledge and interest but also interest and knowledge of the technology.

Probe. Observation is followed or coupled with probing for information. Most teachers have at their command a number of strategies for getting at and then activating their students' prior knowledge of content or skills. Probing usually centers on asking questions. One framework is KWL, which is a mnemonic for: What do students *know*? What do students *want* to learn? And later, What have students *learned*? It is usually more helpful to ask questions about what is important to future learning, rather than what is unusual or different. Often it can be as simple as "What do you know about…?" or "What can you tell me about…?"

A similar approach is useful when probing students' technological knowledge. Do students know simple functions, such as how to turn on the device, how to use gestural screen commands, how to open an app, how to bring up the keyboard, and so forth? Probing to understand how well students can use a tablet device can be couched in demonstration terms: "Can you show me how to…?" Probing can be done with individuals, small groups, or whole classes. This is an important step in analyzing the teaching and learning situation before making learning design decisions.

Unify. Observing and probing provide information that can compose a holistic approach to learning design. This information should lead to more than merely a starting point. For example, if the teacher observes that students do not know how

to open a note-taking app, bring up the keyboard, key in text, and save what they have done to come back to later, then the framework of the learning design will need to be constructed toward a technological literacy goal, namely, how to use a note-taking app. On the other hand, if observing and probing reveal that students know how to manipulate an app about, say, doing basic algebra, then the framework of the learning design can be constructed toward a goal of using the app and integrating tablet-based lessons with group and individual classroom activities to increase content knowledge and skills in algebra.

The idea behind unifying as an analytical step is that a goal, or endpoint, in a learning design is implicit in the starting point. Effective learning design can be best accomplished through well organized—in other words, unified—lesson components, rather than vague, sweeping concepts or worse, large-scale, overly detailed, preprogrammed approaches that ignore the day-to-day classroom realities of teaching and learning.

Stage. To stage learning design during the analysis phase of the ADDIE model means to begin consideration of how teaching and learning might proceed in an orderly manner. Staging will be further refined in later ADDIE phases. The intent at this point is simply to initiate thinking about how a learning design that incorporates designated subject matter and tablet technology might be ordered.

From a constructivist viewpoint, the gradual release of responsibility model offers a helpful concept. The model's principles are straightforward and hardly unique, but the model name is attributed to P. David Pearson and Margaret C. Gallagher (1983). The model contains essentially four steps:

- Modeling—"I do, you watch"
- Sharing—"I do, you help"
- Guiding—"You do, I help"
- Applying—"You do, I watch"

These steps are sometimes given other labels. For example, they might be *demonstration, guided practice, independent practice,* and *application*. The point is that the teacher gradually relinquishes control of learning as students assume control and self-direction. The staging phase of analysis offers an opportunity to consider how the learning design might be constructed to foster student investment and involvement in learning and, ultimately, independence.

5.5 Summary

Predominantly constructivist approaches to learning design emphasize real-world complexities, and those complexities include the use of computer technology not only "out there" but in schools and individual classrooms. One-to-one tablet technology offers new opportunities for students to engage in technology-mediated learning that are more personal, more individualized than was possible in the computer lab and shared computer school environments.

The ADDIE approach to learning design is adaptable to virtually any classroom situation, subject matter, and age/grade level. The *A* in the acronym—analysis—encompasses both art and science as the learning designer examines content, processes, and technology. Call it developing a "story," as Michael Shermis does, or use another term. The result is the same: a first step toward developing an effective design for learning.

Within analysis, use of the OPUS strategy frames a systematic approach. By incorporating observation, probing, unifying, and staging, the teacher can reasonably ensure a thorough analysis on which to base the learning design.

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