Application Questions

1. Examine some of the literature that discusses Situational Leadership. Write a paper or present a talk on its main components and how they are applied in work situations.

2. Assume that you have received a two-year grant to develop a twelve-unit, multimedia training program. You are the project director and are responsible for timely completion of the product. Using Situational Leadership as a guide, describe how you would lead your team through each of the four quadrants.

3. BCL Enterprises employs 225 people; 25 management positions and 200 other individuals divided into ten teams. Several teams have problems meeting deadlines and getting along with each other. You have been hired as a team-building expert to evaluate the situation and develop solutions to the problems. Explain what you would do and why.

4. If you are an instructional project manager, describe how you will assemble a team. How will you monitor people and products? How will you give feedback? Finally (and most important), how will you celebrate the end of a successful project?

CHAPTER 14
ADOPTION, DIFFUSION, IMPLEMENTATION, AND INSTITUTIONALIZATION OF INSTRUCTIONAL DESIGN AND TECHNOLOGY

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Editors' Introduction
The integration of instructional innovations into both academic and corporate settings is one of the most important parts of the instructional design process. Although it was once common to believe that effective, well-designed instructional innovations would be readily adopted, this belief has proven to be a fallacy. Research, much of it based on the work of E. M. Rogers, has shown that a variety of social, personal, organizational, economic, and technical factors combine to influence the rate at which an innovation is adopted and diffused. In this chapter, Dan Surry and Dan Ely provide an overview of diffusion theory and describe the key findings of diffusion researchers working within the field of instructional design and technology. The authors also discuss the emerging view that implementation and institutionalization, rather than adoption and diffusion, should be the focus of research in this area.
Knowledge and Comprehension Questions
1. Describe each of Rogers’s four main concepts related to diffusion: the Innovation-Decision Process Model, adopter categories, perceived attributes, and S-shaped curve.
2. List the five steps of Burkman’s User-Oriented Instructional Development Model.
3. Describe each of the eight conditions that facilitate the implementation of an innovation.
4. Describe what it means for an innovation to have become institutionalized. Be sure to refer to the six commonly accepted indicators of institutionalization (Gerrard, Fleming, & Ready, 1999).

Instructional design and technology is a field of innovation and change. Many of the most important products and practices developed by instructional designers require dramatic shifts in the way we think about, deliver, administer, and assess instruction and training. Studying the adoption, diffusion, implementation, and institutionalization of innovations is essential to the field of instructional design and technology because the field has suffered from a lack of widespread acceptance of technology (Burkman, 1987). While it is possible to point to some notable exceptions, such as the common use of e-mail or word processors in higher education (Green, 1996) or the growing use of performance technology in industry (Dresner & Harman, 1996), the way in which education and training are conducted has changed very little during the past few decades.

One major reason for this lack of utilization is that instructional designers have concentrated their efforts on developing instructionally sound and technically superior products while giving less consideration to other issues. Technical superiority, while important, is not the only factor that determines whether or not an innovation is widely adopted; it might not even be the most important factor (Pool, 1997). A complex web of social, economic, technical, organizational, and individual factors interact to influence which technologies are adopted and to alter the effect of a technology after it has been adopted (Segal, 1994). To fully understand the field, practitioners have to understand more than just hardware, software, design models, and learning theory. Understanding why people use educational technology and—perhaps more important—why they don’t is at the core of the process. That’s where adoption, diffusion, implementation, and institutionalization come in.

In this chapter, we discuss the adoption, diffusion, implementation, and institutionalization of educational technology. We will begin by looking at some of the best-known theories about adoption and diffusion. After this, we will discuss some examples of how adoption and diffusion theory has been incorporated into the field of educational technology. Then we will discuss a very important trend: the gradual shift in focus from thinking about adoption (the initial decision to use an innovation) to thinking about implementation and institutionalization. We will define implementation and institutionalization and discuss why this shift is happening. We will also provide a list of conditions that contribute to implementation (Filly, 1995) and include a summary and conclusions.

Overview of the Adoption and Diffusion Process
There has been a long and impressive history of research related to the adoption and diffusion of innovations (Sutry & Brennan, 1998). Many of the most important and earliest studies in this area were conducted by researchers working in the field of rural sociology (Rogers, 1995). In fact, a study that investigated the diffusion of hybrid-seed corn (Ryan & Gross, 1943) is considered to be the first major, influential diffusion study of the modern era (Rogers, 1995). Other researchers have investigated the diffusion of innovations in such diverse fields as solar power (Keeler, 1976), farm innovations in India (Sekon, 1968), and weather forecasting (Sutry, 1993).

The most widely cited and most influential researcher in the area of adoption and diffusion is Everett Rogers. Rogers’s Diffusion of Innovations is perhaps the single most important book related to this topic and provides a comprehensive overview of adoption and diffusion theory. It was first published in 1962 and is now in its fourth edition (Rogers, 1995).

One of the most important theories discussed by Rogers is the Innovation-Decision Process Model. As shown in Figure 14.1, this model suggests that the adoption of an innovation is not a single act, but a process that occurs over time. Potential adopters go through five stages when interacting with an innovation. The first stage is Knowledge, in which potential adopters find out about an innovation and gain a basic understanding of what it is and how it works. The second stage is Persuasion, in which potential adopters form a positive or negative impression of the innovation. It is only in the third stage, Decision, that the innovation is actually adopted or rejected. The fourth stage, Implementation, occurs when the innovation is actually used. In the fifth stage, Confirmation, the adopter seeks information about the innovation and either continues or discontinues use of the innovation. The Confirmation stage might also describe the adoption of an innovation that was previously rejected.

Another important and influential idea discussed by Rogers is the concept of adopter categories. This concept states that for any given innovation, a certain percentage of the population will readily adopt the innovation, while others will be less likely to adopt. According to Rogers (1995), there is usually a normal distribution of the various adopter categories that forms the shape of a bell curve (see Figure 14.2). Innovators, those who readily adopt an innovation, make up about 2.5% of any population. Early Adopters make up approximately 13.5% of the population. Most people will fall into either the Early Majority (34%) or Late Majority (34%) category. Laggards, those who will resist an innovation until the bitter end, make up about 16% of the population.

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categories is important because it shows that all innovations go through a natural, predictable, and sometimes lengthy process before becoming widely adopted within a population.

The concept of perceived attributes (Rogers, 1995) has served as the basis for a number of diffusion studies (e.g., Fleegel & Kivlin, 1966; Wyner, 1974). The term "perceived attributes" refers to the opinions of potential adopters who base their feelings about an innovation on how they perceive that innovation in regard to five key attributes: Relative Advantage, Compatibility, Complexity, Trialability, and Observability. In short, this construct states that people are more likely to adopt an innovation if the innovation offers them a better way to do something; is compatible with their values, beliefs, and needs; is not too complex; can be tried out before adoption; and has observable benefits. Perceived attributes are important because they show that potential adopters base their opinions of an innovation on a variety of attributes, not just relative advantage. Therefore educators and technologists should try to think about how potential adopters will perceive the innovations in terms of all of the five attributes and not focus exclusively on technical superiority.

The S-shaped adoption curve is another important idea that Rogers (1995) has described. This curve shows that a successful innovation will go through a period of slow adoption before experiencing a sudden period of rapid adoption and then a gradual leveling off. When depicted on a graph, this slow growth, rapid expansion, and leveling off form an S-shaped curve (see Figure 14.3). The period of rapid expansion for most successful innovations occurs when social and technical factors combine to permit the innovation to experience dramatic growth. For example, one can think of the many factors that combined to lead to the widespread acceptance of the World Wide Web between the years 1995 and 2000.

**Diffusion Theory Applied to Instructional Design and Technology**

The theories and concepts discussed by Rogers in *Diffusion of Innovations* are applicable to the study of innovations in almost any field. A number of researchers have used these theories and concepts to study the adoption and diffusion of instructional design and technology innovations. In the field of instructional design and technology, diffusion theory has most often been applied to the study of either artifacts, such as computers, or knowl-

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**FIGURE 14.2** Hypothesized distribution of adopter categories within a typical population. 
*Note: Reprinted with permission, from Rogers (1995).*

**FIGURE 14.3** Example of an S-shaped curve showing initial slow growth, a period of rapid adoption, and a gradual leveling off. 
*Note: Reprinted with permission, from Rogers (1995).*

edge, such as innovative teaching techniques (Holloway, 1996). Ernest Burkman (1987) is one of the authors who specifically links diffusion theory with instructional design and technology. Burkman realized that instructional design and technology had been suffering from little utilization and turned to diffusion theory for a possible solution. He used perceived attributes to develop a method for developing instructional products that would be more appealing to potential adopters. Burkman called his new approach "user-oriented instructional development (UID)." The five steps in Burkman’s UID are as follows:

1. Identify the potential adopter.
2. Measure relevant potential adopter perceptions.
3. Design and develop a user-friendly product.
4. Inform the potential adopter (of the product’s user-friendliness).
5. Provide post-adoption support.

Besides Burkman, other researchers have incorporated diffusion theory into instructional design and technology applications. For example, Stockdill and Morehouse (1992) used diffusion concepts in a checklist of factors to consider in attempting to increase the adoption of distance learning and other educational technologies. Farquhar and Surry (1994) used diffusion theory to identify and analyze factors that might impede or assist the adoption of instructional innovations within organizations. Sherry, Lawrey-Brook, and Black (1997) used diffusion concepts as the basis for an evaluation of a program intended to introduce teachers to the Internet. A growing amount of dissertation research is being conducted in the area of diffusion theory as it is related to instructional design and technology.

**From Adoption and Diffusion to Implementation**

There appears to be a growing trend in innovation research away from adoption and diffusion toward implementation and institutionalization. As the adoption and diffusion process moves along, the actual use or implementation of an innovation in a specific setting becomes more and more important. Of course, implementation should be as integral
part of a comprehensive and systematic change plan from the beginning. Michael Fullan, a prominent researcher in this area, defines implementation as "the actual use of an innovation in practice." Further, he calls the implementation perspective "both the content and process of dealing with ideas, programs, activities, structures, and policies that are new to the people involved" (Fullan, 1996 p. 273). Until Fullan and Pomfret (1977) spelled out the process and issues in their review of implementation research, not much was said about the steps after diffusion and adoption.

From Replication to Mutual Adaptation

In the process of implementation, innovations that require replication for successful outcomes often follow an approach that is analogous to behavioral learning. That is, each product, procedure, and practice has to maintain a high fidelity to the original, or else success cannot be guaranteed. Fullan and Pomfret (1977) introduced the concept of "mutual adaptation" (p. 360) whereby local conditions should be considered and modification of original materials and procedures should be altered accordingly. It was believed that the local professionals could make better assessments of the needs and potential reception of the innovation than the original developer or researcher. Purists, however, felt that if replication was not identical to the original specifications, implementation might fail. Once professional educators realized that they could modify programs, products, and practices, it was a short step to an approach that was less "lockstep" and more analogous to constructivism. Local participation in the modifications created a greater sense of ownership of the instructional innovations.

Other Models

One of the tools that is often used to guide implementation efforts in schools is Hall's Concerns Based Adoption Model (CBAM) (Hall & Hord, 1987). In the implementation phase of this model, the Levels of Use (LoU) scale is introduced (Hall & Loucks, 1978). The basic levels are None, Orientation (initial information), Preparation (to use), Mechanical use, Routine, Refinement, Integration, and Renewal. The last four levels actually move into the area of institutionalization, discussed later in this chapter. A modification of the LoU Levels of Technological Implementation (LoTI), based on measurement of classroom use of computers, has been proposed by Moersch (1995). Moersch modifies Hall's levels to provide guidance for determining the extent of implementation using seven levels: None, Awareness, Exploration, Infusion, Integration, Expansion, and Refinement.

What About Resistance to Innovations?

Over the years, there have been studies and explorations of the resistance factors that thwart diffusion and implementation efforts. Prominent among those who have journeyed into this puzzling morass are Zaltman and Duncan (1977). These authors define resistance as "any act that serves to maintain the status quo in the face of pressure to alter the status quo" (p. 61). The basic argument has been that if we knew what types of resistance exist, perhaps we could design strategies to combat them. There are many different types of resistance. They can be classified as cultural, social, organizational, and psychological. The authors indicate that implementation has been successful only when strategies for overcoming specific points of resistance have been developed.

Looking for Facilitative Conditions

A less common approach to understanding the process of implementation has been to tease out reasons for successful programs rather than to identify the barriers. Where innovations have been adopted and implemented, what are the conditions that appear to facilitate the process? Are there consistencies among the facilitating conditions from innovation to innovation and from place to place? This logic reverses a concern for resistance to a more positive one of facilitating factors, thus providing an avenue for further exploration. Rather than coming up with ways to get around resistance, a series of studies looked at successful implementation of innovations and asked, "Why were these innovations successful?" The findings of these studies uncovered eight conditions that contribute to implementation (Ely, 1999):

1. Dissatisfaction with the status quo. Things could be better. Others seem to be moving ahead while we are standing still. Dissatisfaction is based on an innate feeling or is induced by a "marketing" campaign.
2. Knowledge and skills exist. Knowledge and skills are those required by the ultimate user of the innovation. Without them, people become frustrated and immobilized. Training is usually a vital part of most successful innovations.
3. Availability of resources. Resources are the things that are required to make implementation work—the hardware, software, audiovisual media, and the like. Without them, implementation is reduced.
4. Availability of time. Time is necessary to acquire and practice knowledge and skills. This means good time—company time and not just personal time at home.
5. Rewards and/or incentives exist. An incentive is something that serves as an expectation of a reward—a stimulus to act. A reward is something given for meeting an acceptable standard of performance.
6. Participation. This is shared decision making—communication among all parties involved in the process or their representatives.
7. Commitment. This condition demonstrates firm and visible evidence that there is endorsement and continuing support for the innovation. This factor is seen most frequently in those who advocate the innovation and their supervisors.
8. Leadership. This factor includes leadership of the executive officer of the organization and, sometimes, by a board and leadership within the institution or project related to the day-to-day activities of the innovation being implemented.
Variables in the Setting and the Innovation Itself

It is clear that the eight conditions are present in varying degrees whenever examples of successful implementation are studied. What is not so clear is the role of the setting in which the innovation is implemented. The setting and the nature of the innovation are major factors influencing the degree to which each condition is present. Some of the variables in the setting include organizational climate, political complexity, and certain demographic factors. Some of the most important variables regarding the innovation are the attributes of the innovation discussed earlier—its relative advantage (when compared with the current status), compatibility with the values of the organization or institution, complexity (or simplicity), trialability before wholesale adoption, and observability by other professionals or the public. But is implementation the final stage?

Implementation should lead naturally into institutionalization. Some writers call it " routinization" or " continuation. " The ultimate criterion for a successful innovation is that it is routinely used in settings for which it was designed. It has become integral to the organization or the social system and is no longer considered an innovation. Institutionalization takes place when an innovation is assimilated into the structure of an organization and changes that organization in a stable way (Miles, Eckholm, & Vandenbusha, 1987).

Indicators of Institutionalization

According to the Regional Laboratory for Educational Improvement of the Northeast and Islands (Eiseman, Fleming, & Roody, 1990), there are six commonly accepted indicators of institutionalization:
1. Acceptance by relevant participants—a perception that the innovation legitimately belongs
2. The innovation being stable and routinized
3. Widespread use of the innovation throughout the institution or organization
4. Firm expectation that use of the practice and/or product will continue within the institution or organization
5. Continuation depending not on the actions of specific individuals but on the organizational culture, structure, or procedures
6. Routine allocations of time and money

Once implementation has been achieved, one more decision must be made: Is this innovation something we want to continue for the immediate future? If it is, the above criteria could be used to assess the extent to which the innovation is institutionalized. Several other indicators of routine use, called passageways and cycles, are listed by Yin and Quick (1978): support by local funds, new personnel classification, changes in governance, internalization of training, and turnover of key personnel.

Conclusion

Case studies of diffusion, adoption, implementation, and institutionalization have been conducted in many organizations and settings. One important conclusion is that there is no formula for this process. There are many elements that should be considered in the process, most of them outlined in this chapter. However, simple transfer of these principles to specific environments would likely be futile. Just as most instructional development requires a systemic approach, so does the change process. There is no substitute for a front-end analysis or needs assessment that yields the goals and objectives to be attained. Communication among all participants throughout the process is essential. A strategy or plan for achieving the goals is the best way to proceed in considering the many variables that are likely to affect the outcomes. Evaluation should be a constant partner during the process.

All of this activity should be coordinated by a change agent—a person who is sensitive to the variables that will impinge on the process. The change agent could be an internal person or an external specialist. Awareness and experience with the change process are essential for a successful outcome.

References


Ely, D. P. (1999, February). New perspectives on the implementation of educational technology innovations: Paper delivered at the Association for Educational Communications and Technology Annual Conference, Houston, TX.


