What is Instructional-Design Theory and How is it Changing?

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The purpose of this chapter is to provide some ideas that will help you analyze and understand the instructional-design theories presented in this book. First, we will explore what an instructional-design theory is. This will include a discussion of the role that values play in instructional-design theories and a discussion of what an instructional-design theory is not. In the second half of the chapter, we will explore the Deed for a new paradigm of instructional-design theory. In particular, we will look at the Deed for a paradigm of training and education in which the learner is at the top of the organizational chart rather than the bottom. Then we will look at the implications that such a paradigm has for instructional-design theory, including the extent to which some of the design decisions should perhaps be made by the learners while they are learning.

WHAT IS AN INSTRUCTIONAL-DESIGN THEORY?

An instructional-design theory is a theory that offers explicit guidance on how to better help people learn and develop. The kinds of learning and development may include cognitive, emotional, social, physical, and spiritual. For example, in Smart Schools, Perkins describes an instructional-design theory, called "Theory One," which offers the following guidance for what the instruction should include to foster cognitive learning. The instruction should provide:

- **Clear information.** Descriptions and examples of the goals, knowledge needed, and the performances expected.
- **Thoughtful practice.** Opportunity for learners to engage actively and reflectively whatever is to be learned—adding numbers, solving word problems, writing essays.
- **Informative feedback.** Clear, thorough counsel to learners about their performance, helping them to proceed more effectively.
- **Strong intrinsic or extrinsic motivation.** Activities that are amply rewarded, either because they are very interesting and engaging in themselves or because they feed into other achievements that concern the learner (Perkins, 1992, p. 45).

This is an instructional-design theory. Of course, Perkins elaborates on each of these guidelines in his book, but this overview provides a good example of what an instructional-design theory is like. So what are the major characteristics that all instructional-design theories have in common?

First, unlike more familiar kinds of theories, instructional-design theory is *design-oriented* (focusing on means to attain given goals for learning or development), rather than description oriented (focusing on the results of given events). In the case of Theory One, the goal is to enhance learning "for any performance we want to teach" (p. 45). Being design oriented makes a theory more directly useful to educators, because it provides direct guidance on how to achieve their goals.

Second, instructional-design theory identifies *methods* of instruction (ways to support and facilitate learning) and the *situations* in which those methods should and should not be used. In the case of Theory One, the methods (at this general level of description) are: clear information, thoughtful practice, informative feedback, and strong motivators. Perkins goes on to say, "Good teaching demands different
methods for different occasions” (p. 53), and he describes how Theory One can underlie each of Adler's (1982) three different ways of teaching: didactic instruction, coaching, and Socratic teaching.

Third, in all instructional-design theories, the methods of instruction can be broken into more detailed component methods, which provide more guidance to educators. In the case of Theory One, Perkins provides considerable information about components for each of the four basic methods. For example, within the didactic framework, Perkins describes some of the components for clear information, based on Leinhardt's (1989) research:

- identification of goals for the students;
- monitoring and signaling processes toward the goals;
- giving abundant examples of the concepts treated;
- demonstration;
- linkage of new concepts to old ones through identification of familiar, expanded, and new elements;
- legitimizing a new concept or procedure by means of principles the students already know, cross-checks among representations, and compelling logic (Perkins, 1992, pp. 53-54).

And fourth, the methods are probabilistic rather than deterministic, which means they increase the chances of attaining the goals rather than ensuring attainment of the goals. In the case of Theory One, "Giving abundant examples of the concepts treated" will not ensure that the goals for the students win be attained. But, it will increase the probability that they win be attained.

So, instructional-design theories are design oriented, they describe methods of instruction and the situations in which those methods should be used, the methods can be broken into simpler component methods, and the methods are probabilistic. Each of these characteristics of instructional-design theories is described in more detail next.

**Design-Oriented Theories**

An important characteristic of instructional-design theories is that they are design oriented (or goal oriented). This makes them very different from what most people usually think of as theories. Theories can be thought of as dealing with cause-and-effect relationships or with flows of events in natural processes, keeping in mind that those effects or events are almost always probabilistic (i.e., the cause increases the chances of the stated effect occurring) rather than deterministic (i.e., the cause always results in the stated effect). Most people think of theories as descriptive in nature, meaning that the theory describes the effects that occur when a given class of causal events occurs, or meaning that it describes the sequence in which certain events occur. For example, information-processing theory is descriptive. Among other things, it says that new information enters short-term memory before it enters long-term memory. It doesn’t tell you how to facilitate learning. Descriptive theories can be used for prediction (given a causal event, predict what effect it will have; or, given one event in a process, predict what event will likely occur next) or for explanation (given an effect that has occurred, explain what must have caused it or preceded it).

But design-oriented theories are very different from descriptive theories (see e.g., Cronbach & Suppes, 1969; Simon, 1969; Snellbecker, 1974; Reigeluth, 1983b, which is chapter 1 in Volume 1 of this book). Design theories are prescriptive in nature, in the sense that they offer guidelines as to what method(s) to use to best attain a given goal. (They are not usually prescriptive in the sense of spelling out in great detail exactly what must be done and allowing no variation. Prescription in that sense only applies to deterministic - or positivistic - theories, which are almost nonexistent in the social sciences.) For example, if you want to help long-term retention of some new information to occur (an instructional goal), you should help the learner to relate that information to relevant prior knowledge (an instructional method).
Some Thoughts About Theories, Perfection, and Instruction

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PRELIMINARIES: THOUGHTS AND ANECDOTES ABOUT THEORIES, GUIDELINES, AND INSTRUCTIONS

Researchers' Versus Practitioners' Views
About Theories: Two Anecdotes

After a researcher had discussed current findings with colleagues, the colleagues asked why "other topics" were not also addressed by the researcher and by the theory from which the research plans were developed.

An instructor found a theory to be very interesting, was persuaded that the theory explained many things that occurred with students, and then tried to change almost all aspects of classroom instruction to fit the particular theory; in a sense, the instructor tried to create curriculum and instruction based on the theory.

Theories: Guidelines, Not Perfection

Dewey (1929) writes:

The third point is that laws and facts, even when they are arrived at in genuinely scientific shape, do not yield rules of practice. Their value for educational practice - and alt education is a mode of practice, intelligent or accidental and routine - is indirect; it consists in provision of intellectual instrumentalities to be used by the educator. (p. 28)

Furthermore, Popper (1957) notes that “All theories are trials; they are tentative hypotheses, tried out to see whether they work; and all experimental corroboration is simply the result of tests undertaken in a critical spirit, in an at tempt to find out where our theories err” [italics added] (p. 87).

One Theory Versus Many Theories: What if No "Complete" Theory Exists?

Hall & Lindzey (1957) strongly recommended "that the student should, once he has surveyed the available theories of personality, adopt an intolerant and affectionate acceptance of a particular theoretical position without reservation, ...wallow in it, revel in it, absorb it, learn it thoroughly, and think that it is the best possible way to conceive of behavior" (pp. 556-557).

In response to the e-mail message “Teacher training colleges and universities must emphasize CL as the primary teaching paradigm,” Michael Scriven wrote: “Too bad. I’d buy allowing CL, pending more serious evaluation, but as for establishing it, that way dogma lies and dogma always lies” (AERA-C, Division C: Learning and Instruction listserv, December 8, 1996).

And perhaps the following slogan could be applied, analogously, to theories of instruction: “We don't make a lot of the products you buy. We make a lot of the products you buy better.”TM (Trademark of BASF Corporation).
INTRODUCTION

This volume provides an overview of instructional theories and models that are increasing our understanding about instruction and that can help practitioners to design conditions that facilitate learning. Earlier (Paterson, 1977; Snelbecker, 1974, 1983) it was noted that, though the practice of education has been a matter of concern for centuries, formally organized instructional theories were not available until the middle of the 20th century. The two anecdotes and five quotations, above, were selected because collectively they reflect some of the conflicting views and expectations that people have about the nature and value of instructional theories. Although most would agree that instructional theories, compared with learning theories, are closely related to practice, people have different expectations about whether instructional theories “should” (a) give explicit detailed prescriptions for practice or (b) mainly provide general guidelines that practitioners can use to design instruction.

What should we expect from a particular instructional theory and from theories in general? One goal for this chapter is to provide some ideas that will be useful as you examine the array of instructional theories and models presented in this book. Another goal is to stimulate constructive dialogues among advocates of various theories, even between “competitive” groups, about ways to further our understanding about designing instruction to facilitate learning. A third goal is to propose some ways for “identifying the scope” of a particular theory (or the implications and limitations of research findings). This chapter includes descriptions of “theory integration” ventures regarding psychotherapy theories because they may be applicable to instructional theories, and also explains how an interesting advertising slogan might help readers to clarify what respective theories and research reports do and do not address in a given practical situation.

Before proceeding further, it is important to clarify what is meant, in this chapter, by certain terms. First, theory refers to an organized set of propositions that are syntactically and semantically integrated (that is, that follow certain rules by which they can be logically related to one another and to observable data) and that serve as a means of predicting and explaining observable phenomena. Some authors use the term model to designate a concretization of a theory, or they use the terms model or miniature model to refer to theories with a more narrowly defined scope of explanation. In this chapter, theory will be used broadly to refer to all of the examples just noted, including what some authors may call theories and others may call models. Second, instructor will be used collectively to refer to both teachers and trainers. Third, for brevity in this chapter, instructional theory will be used instead of instructional-design theory.

Cultural Differences Among People Interested in Instructional Theories

It is important to recognize the existence of “cultural differences” among people who have an interest in instructional theories. In the first volume of this series, I observed (Snelbecker, 1983) that two groups may be interested in the status of instructional theories: the first group, which includes researchers and theorists, I called knowledge producers; the second group, called knowledge users, includes instructors (teachers and trainers), instructional designers, curriculum supervisors, administrators, and other practitioners. As the two anecdotal observations at the beginning of this chapter portray, knowledge producers are less likely to expect research findings or theories to provide definitive answers than are knowledge users. Such fundamental differences are at least partly reflective of the different workplace cultures for knowledge producers versus knowledge users.

Instructors, administrators, and other practitioners work in a culture where they must provide, in a timely and cost-effective fashion, the best possible instruction for the students or clients in their care. They do not have the luxury of waiting until tomorrow for new data or research interpretations; they must make decisions now on the basis of whatever information is available. Moreover, they can rarely select the students or clients with whom they would prefer to work or demand better conditions and support. Stated another way, instead of changing their clients and their setting to fit with some theory, instructors and instructional designers must try to envision how various theories and research findings might be relevant for their clients and their setting, including the resources and constraints that actually exist there.
In contrast, the workplace culture of researchers and theorists dictates that they exercise caution in drawing conclusions and that they consider carefully the variables and conditions involved in their research. To help ensure that research findings are likely to be valid, they have the responsibility of clearly stating research questions, selecting appropriate people to be studied, identifying which variables to study and which to exclude, and preparing appropriate conditions under which to collect data. Otherwise it may not be possible to detect patterns and relationships relevant to the research questions they are trying to answer. This usually means that only certain kinds of people will be appropriate for that particular study, and that many influences and conditions must be excluded or controlled if they are not clearly relevant for the research questions of interest. Even so-called action research and applied research projects, including studies conducted in classrooms or in other practical settings, typically involve changes in the “usual, normal” workplace culture in order for the studies to be appropriately conducted. For example, at a minimum, these studies typically involve extra personnel and extra resources beyond what is customarily available when such studies are not being conducted, and they may also involve selection or assignment of certain students, rather than trying to instruct all of the students regularly found in that setting. On a daily basis in their workplace culture, researchers and theorists typically must offer only tentative conclusions based on currently available data and specify what additional kinds of research need to be conducted, as well as what factors and conditions need to be included (and which excluded), to have well-designed studies that can yield sound information.

The two anecdotes at the beginning of this chapter illustrate how some instructors and other practitioners tend to have expectations about theories that differ from the typical expectations of researchers and theorists. Researchers and theorists who are engrossed in the development and modification of theories tend to be keenly aware of which topics have been addressed and which have been omitted by a particular theory, especially when they are examining someone else’s theory. People who want to use knowledge about instructional theories are often so involved, almost overwhelmed, with the needs and demands of their practical situations that they may not be as critical of the omissions or limitations of a particular theory if and when it appears that the theory may help them address an important, pressing practical concern. Consequently, communication between knowledge producers and knowledge users is sometimes compromised due to their different work cultures.

Even further compounding the problem, when practitioners express great interest in a researcher’s findings or in the apparent practical implications of a theory, it is not so easy for the researcher or the theorist to emphasize the limitations of their offerings to the people displaying such great interest in their work. The knowledge producers, who are quite familiar with academic guidelines (e.g., for journal publications) where one carefully qualifies what is being concluded and identifies what is being omitted, tend to be less conscious of the widely ranging conditions which instructors and other practitioners regularly encounter. Although researchers typically are very cautious in stating how findings from one research environment may be generalized to another research environment, they may not display this cautious attitude when practitioners ask them for help. They may focus so much on the features addressed in their research that they may not adequately take into account all of the myriad conditions and diverse client characteristics with which instructors and other practitioners must deal on a daily basis; thus they may grossly underestimate the differences between their research context and the practical context.

As a result, the practitioners become frustrated and criticize theorists and researchers when their attempts to apply theories do not work out as desired and expected with their clients; the researchers and theorists become hesitant - perhaps almost totally unwilling - to engage in further discussions, as they feel that their ideas have been misunderstood, distorted, and/or grossly misapplied. While many express the view that it is important for knowledge producers and knowledge users to cooperate with each other to their (potential) mutual benefit, it is also recognized that there are barriers to such cooperation (cf. Casanova, 1989; Leby-Leboyer, 1988; Phillips, 1989).
Contrasting Judgments About the Value of Theories

One particular way in which practitioners and researchers/theorists seem to have a cultural gap concerns the basis for judging the value of theories and research findings, especially about the extent to which theories should tell practitioners what to do. Instructional designers and other practitioners primarily judge the value of a theory or of research findings based on the extent to which some practical implications can be derived from them. In contrast, knowledge producers primarily judge the value of a theory or of research findings based on the extent to which they lead to new insights and point to new directions for conducting further studies and constructing theories.

In a sense, the knowledge user is typically looking for help in making practical decisions and wants "final answers" from research findings and theory. The knowledge producer is engaged in an unending attempt to understand particular phenomena and thus views research reports and theory essentially as "progress reports," rather than as final answers. Thus, a teacher or other practitioner may try to modify classroom instruction based on research findings or theory, even though not all aspects of the practical context have been addressed by the theory or research, whereas researchers and theorists are much more likely to discuss what variables and conditions have not been addressed by some study or theory as well as to consider those aspects that have been addressed. However, it should be noted that this close scrutiny may be less likely with their own theories.