

# Pedagogical ID versus Process ID: Two Perspectives in Contemporary Instructional Design Theory

Jerry Willis  
*Marist College*

Although the creation of educational materials has been around at least as long as written history it is only a few decades old as a separate discipline. Instructional design, or ID, emerged from behavioral psychology in the 1960s and has developed into a major aspect of the work of instructional technologists. Today, there are hundreds of ID models that propose to guide us as we create many forms of educational resources. Unfortunately, most of the ID models are what I have called Pedagogical ID models. That is, they are based on the assumption that ID involves selecting the correct theories of learning and instruction, and using them to make decisions about what methods should be used to teach a particular content. Unfortunately, this is a limiting and restrictive view of ID. A broader and more useful approach is Process ID. Process ID models look at ID as a social process engaged in by a team of stakeholders that makes many decisions, including instructional decisions about the instructional resources the team is designing.

Keywords: instructional design, constructivism, educational technology, learning theory, instructional theory, instructional strategies

## INTRODUCTION

A general definition of the term Instructional Design, or ID, is that it is the discipline that focuses on the creation of instructional resources and materials. “Resources and materials” can mean anything from the instructional materials for teaching high school students about the Vietnam war to a virtual reality world students can explore to learn basic chemistry concepts to a state-wide curriculum for high school algebra. When defined this way the meaning of ID overlaps somewhat with other terms such as curriculum development, instructional leadership, and a number of other terms that address issues related to both content and teaching methods used in schools and other learning environments.

While other terms, like curriculum development, are widely used to describe some of the same professional activities that ID covers, what differentiates these terms is their origins. Curriculum development, for example, is based in another discipline, curriculum

and instruction, and the leading theorists, practitioners, and models of curriculum development are typically members of the “curriculum and instruction” or “curriculum development” group. One of the leading organizations for this group is the Association for Supervision and Curriculum Development (ASCD) which was founded in 1943 but has links that go back much further. ID, on the other hand, has a shorter formal history and is tied to other organizations. ID is, essentially, a field within instructional technology (or educational technology) and the organizations that support this group of professionals include the Association for Educational Communication and Technology (AECT) which was founded in 1970 but is the modern version of the Division of Visual Instruction, founded in 1923, of the National Educational Association. Other organizations that support educational technology include the International Society for Technology in Education (ISTE), which traces its history back to regional and then national organizations founded in the 1960s and 1970s, and the Society for Information Technology and Teacher Education (SITE) which was founded in 1990.

Although there have been a number of efforts to expand the influence of ID as a discipline outside the field of educational technology, most of those efforts have not been successful. The scholarship on curriculum development (CD) is much richer, much more diverse, and more influential than the scholarship on ID. While ID remains an active discipline within the field of educational technology, and there are many papers and presentations on issues related to ID, that discourse is limited primarily to the field of educational technology while CD scholarship is influential well beyond the boundaries of the field of curriculum and instruction. In this paper I will offer some suggestions about why ID has had little influence outside the borders of its parent discipline – educational technology – and I will suggest a way we might refocus our attention on ID that may expand the influence of ID beyond the relatively small field of educational technology.

Despite its lack of influence outside educational technology ID remains a very active and important component of the work instructional designers do. That ID is a virtually universal part of educational technology is demonstrated by the fact that at least one course on ID is part of almost every graduate degree program in educational or instructional technology (ET) offered in North American and in most of the rest of the world. That statement does not, however, mean that ID is a stable, easily defined component of ET. What we mean by the term ID, and what is taught in courses with ID in the title, is not as well settled as you might think.

### **THE TWO MEANINGS OF ID: *PEDAGOGICAL ID* AND *PROCESS ID***

As you read the scholarly literature on ID, you will find two related but very different uses of the term. Both have the core idea that ID involves the creation of instructional materials and educational resources. However, one use of the term ID is to indicate the theories of learning, the principles of teaching and learning, and the pedagogical strategies that should be used in creating those educational materials and resources. In this tradition, the core responsibility of the instructional designer is to make the “right” choices about:

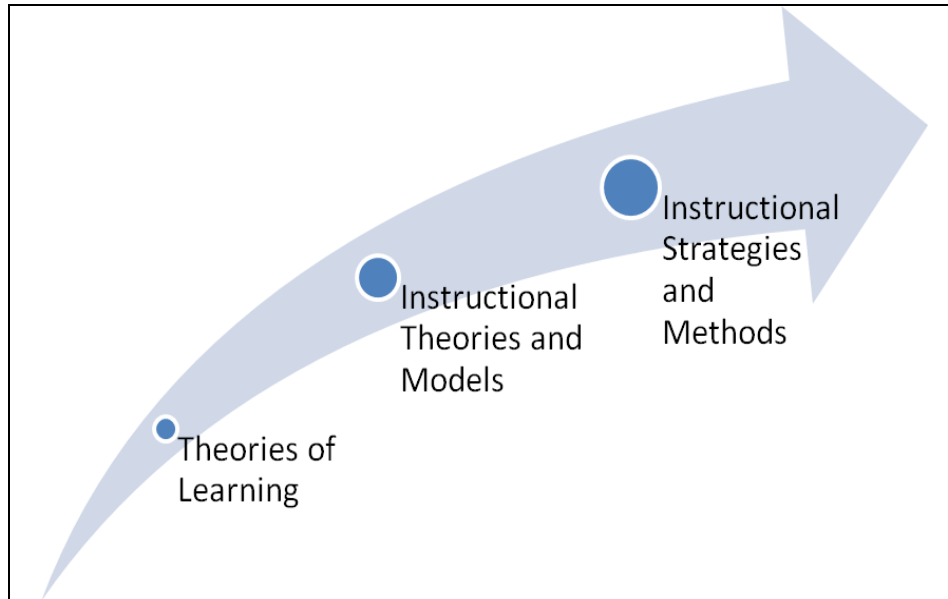
- theories of learning (e.g., behaviorism, cognitive science, constructivism, critical pedagogy, and so on),
- instructional theories and models for teaching and learning (e.g., direct instruction, student-centered instruction, constructivist learning) and pedagogies and strategies (e.g., strategies such as problem-based learning, tutorials, simulations, and so on). (See Figure 1)

I will call this use of the term *Pedagogical ID* because it emphasizes the responsibility of the instructional designer to choose or help choose the right way to teach

the content that has been selected. In the pedagogical ID literature, the instructional designer is someone:

- with knowledge of scientifically proven theories that tell us which teaching strategies should be used to teach each type of content,
- who uses a technical-rational approach to designing instructional materials, and
- who serves as the leader and expert on the design team because the designer has special knowledge that others do not

*Figure 1.* The areas of Expertise Required of Designers from a Pedagogical ID Perspective.



The work of the designer is in the technical-rational tradition because it involves using scientifically established rules about what types of learning theories, and what types of teaching strategies, are best for teaching various types of content to design instructional materials. The underpinnings of the pedagogical ID perspective are concisely expressed by M. David Merrill and the ID2 Research Group (1996) at Utah State University:

*The discipline of Instructional Design*

- There is a scientific discipline of instructional design.
- The discipline of instructional design is based on a set of specific assumptions.
- The discipline of instructional design is founded on scientific principles verified by empirical data.

Those persons who claim that knowledge is founded on collaboration rather than empirical science, or who claim that all truth is relative, are not instructional designers. They have disassociated themselves from the discipline of instructional design.

*Instruction and Learning*

- Instructional design is a technology for the development of learning experiences and environments which promote the acquisition of specific knowledge and skill by students.

- Instructional design is a technology which incorporates known and verified learning strategies into instructional experiences which make the acquisition of knowledge and skill more efficient, effective, and appealing.
- While instruction takes place in a larger organizational context, the discipline of instructional design is concerned only with the development of learning experiences and environments, not with the broader concerns of systemic change, organizational behavior, performance support, and other human resource problems.
- Instruction involves directing students to appropriate learning activities; guiding students to appropriate knowledge; helping students rehearse, encode, and process information; monitoring student performance; and providing feedback as to the appropriateness of the student's learning activities and practice performance. (Merrill and ID2 Research Group, 1996)

This view of ID is widely held and often used as the unstated framework for a great many papers, especially case studies, that describe a particular instructional design project. The definition below, which is frequently quoted from the Internet, is a definition of Pedagogical ID:

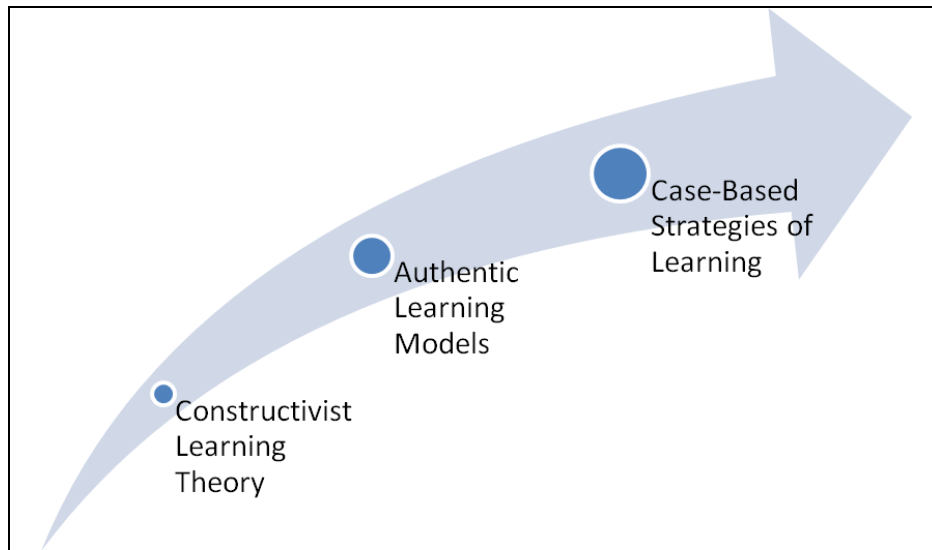
Instructional Design is the systematic process of translating general principles of learning and instruction into plans for instructional materials and learning.

(Retrieved from <http://www.elearnspace.org/Articles/InstructionalDesign.htm> )

A case study that takes for granted the framework of pedagogical ID is the work of Sue Bennett, Barry Harper and John Hedberg (2001) at the University of Woologong. Although this is a sophisticated analysis of the instructional design process, the focus is essentially on the creation of instructional resources based on case-based instructional approaches. The authors relate the instructional strategies they support to constructivist learning theory, especially to the concepts of constructivist learning environments (CLE) and authentic learning, and specifically, case-based instruction. The paper describes how the authors developed cases for use in their course (Interactive Multimedia Design) for novice designers. The authors provide background information on case-based learning and review some of the basic principles for effective case-based learning. The bulk of the paper, however, is on the application of the principles of case-based learning to the creation of two cases for their course. The authors conclude that the use of cases in their course contributes to the learning of students.

This paper is, essentially, the description of how the authors used knowledge about a pedagogy to create new learning materials (See Figure 2). While this is a very interesting paper, the focus is on pedagogical knowledge and the application of that knowledge to the creation of new instructional resources. There is not, however, very much information about the process of design – how the authors went about designing the new materials. We know quite a bit about the instructional theories but not about the design process that these authors used. The paper ends with suggestions about the use of the pedagogy – case based learning. While the pedagogical approach to ID is helpful and useful, I find another approach, ID as a process, to be a broader and more useful as a guide to thinking about instructional design.

Figure 2. The Levels of Pedagogical Knowledge Used by Bennett, Harper, & Hedberg.



### ID AS A PROCESS

The other use of the term ID is to indicate the *process* by which educational materials and resources are developed. This general definition of ID as a process for accomplishing a particular type of design work does not refer to learning theory or instructional strategies. They are, of course, important to an instructional designer, but they are *not* design. ID is the process of designing learning materials, and one aspect of a design team's work is likely to be the use of knowledge and theories from many different disciplines. Theories of learning and pedagogy are part of the tool set that instructional design teams use, but there is a difference between designing and the tools a designer uses. We do not equate nailing with being a carpenter or knowledge of the load bearing capacities of beams with the entire profession of architecture.

Pedagogical ID has been the dominant way of thinking about ID since it became a more formal and separate professional practice about fifty years ago. One possible reason why the Pedagogy ID model has been so dominant was outlined by Päivi Häkkinen (2002). She provides a broad but traditional definition of instructional design: "The process of instructional design attempts to develop an understanding of the conditions and desired outcomes of instruction, and to use all of this in specifying methods of instruction. . . ." (p. 461). This is a definition most advocates of Pedagogical ID would be comfortable with. It emphasizes ID as the work of converting general theories and rules about instruction into specific instances of instruction or instructional support. In his inaugural address upon accepting a professorship of educational technology at the Open University of the Netherlands, Jeroen van Merriënboer (1999) echoed this view of ID when he described how ID had been a core component of his research and practice from the beginning. The focus of his address was a discussion of his "10 Commandments for Instructional Design" and a great many of them focused on pedagogy. He presents, for example, a model for teaching "complex cognition" as well as interpersonal skills and attitudes which he describes as "competency-based." He then presents his approach, which is based roughly on the theories and models of cognitive science and constructivist learning theory, as a serious challenge to "designers of instruction" because most of the existing ID theories "that exist for the design of

instruction apply some version of Gagné's Conditions of Learning" which he feels "may work well for a domain that is characterized by independent learning goals, but certainly not for developing competencies that are characterized by highly integrated, complex sets of learning goals" (p. 4). Merriënboer's paper is an exploration of what it would mean to apply his instructional theory to the teaching of complex learning tasks. He discusses many instructional strategies based on constructivist learning and instructional theories. In fact, his paper focuses almost exclusively on which constructivist instructional theories and strategies, and which information and instructional technologies, we should use to support complex learning. However, in the last paragraph of his address, he makes a plea for "a true Discipline of Instructional Design: an integrated branch of knowledge concerned with RTD [Research and Theory Development] directed at new, innovative instructional methods and the actual process for developing *and* implementing those new methods in changing educational organizations" (p. 24). Merriënboer does not have much to say about what that "process for developing *and* implementing those new methods" might be, but he at least recognizes the need to at least give some attention to process as well as instructional theory. New theories, new ways of thinking about teaching and learning, and new instructional theories lead Merriënboer to suggest that the process ID is now an important topic of study and reflection.

Häkkinen (2002) makes a similar point when she notes that "With the rising interest in more open, often computer-based learning environments, traditional definitions of instructional design need adaptation and more sophisticated models of design have been called for" (p. 461). Her paper is an examination of some of the traditional and mainstream foundational assumptions for ID and the challenges they face because of the changing nature of our concepts of teaching and learning. Many of these challenges have come from constructivist learning theorists and practitioners, but there are also challenges from critical pedagogists as well. Häkkinen notes that many ID models are based on a particular theory of learning and related theory of instruction. The theories of Gagne, Merrill, Skinner, Piaget, Vygotsky, and Bruner have all been used as the foundation for ID models. And, because a particular theory of learning was assumed to be the Correct theory, the ID models based on a particular theory of learning have tended to be organized so that the ID process involved little more than performing the tasks needed to produce the type of instruction prescribed by that theory. Häkkinen notes that "the main aim in most of the ID models has usually been to describe the major elements of an instructional environment" (p. 463) but she makes a very important point when she notes that "there is, however, no agreement in the field of learning research on what the important variables are . . . . Of course, instructional environments can be described, but the question arises as to whether they can be described in a meaningful and 'objective' way from the standpoint of learning and instruction" (p. 463). If her analysis of the current state of affairs is true, we do not have the certified knowledge base to use in selecting the Right theory of learning as well as the Right theory of instruction, then we cannot build the Right Pedagogical ID model because the verified knowledge needed to do that is not available. For that, and other reasons I will note later, we need to shift our focus from Pedagogical ID models to Process ID models.

The definition below is a definition of what I call Process ID from Christa Harrelson at the University of Georgia:

When people ask me what instructional technology is, instructional design is a large part of the definition. Instructional design is the process by which instruction, computer-based or not, is created. Instructional design provides a framework for the creative process of design, and ensures the learners' needs are met.

(Retrieved from <http://ttc.coe.uga.edu/christah/clhport/themes.htm#id>)

I am going to use the definition of ID as a process and reject the narrower and, I believe, confusing, use of the term ID to emphasize the application of psychological and instructional theories to creating instructional material. *ID as Pedagogy* is much too narrow a definition, and it completely ignores the idea that the translation of learning and instructional theory into an instructional resource is not a simple or obvious process. It is a rather complex process and there are quite a few disciplines that are relevant to that process. In addition to theories and models of pedagogy, there are fields like organizational change, diffusion of innovation, collaborative and cooperative practice, group decision making, instructional leadership, and project management, to name but a few of the knowledge and professional practice domains that have something to say about the process of ID. Focusing on ID as Pedagogy restricts the influence of these sources of expertise at a time when we could use their input to build more workable and useful models of the ID process.

Focusing on ID as a process would not only expand the range of ideas and concepts that are pertinent to the creation of ID models, it would also expose us to ways of thinking that have already influenced other design fields and other areas of education. For example, the original models of ID were based on behaviorist theories and positivist theories of knowledge. Both these influences led most ID theorists to take the position that scientific research would lead us to the correct answers about many things, including how to teach different types of content. This knowledge would be expressed in laws of behavior that could be applied across many different teaching and learning situations. Most ID models are still based on that core assumption but other areas of education and design have adopted a more flexible and open view of how certain we can be about topics such as instructional strategies and instructional theories. This more “constructivist” approach involves knowing what Aristotle called *phronetic* knowledge, or “practical” knowledge. This type of knowledge, which some call “practical wisdom,” is based on the assumption that local contexts will determine the value of that knowledge. It assumes we do not have enough “universal knowledge” to create recipes for ID that can be applied in many different design environments. In the 1980s and 1990s, several ID research and development projects assumed the reverse – that we did know enough not only to create recipes, we could create automated procedures that would guide novices so that they could create good instructional resources. One outgrowth of research on artificial intelligence was the creation of expert systems that either made decisions or helped professional make decisions about complex topics. Some work in the 1990s was devoted to creating expert systems to guide the work of beginning instructional designers (Locatis & Park, 1992). Merrill and the ID2 Research Group (Merrill & ID2 Expert Group, 1996) worked on the development of one of the best known of the expert systems for instructional design. *ID Expert* was an example of “second generation” instructional design (Cline & Merrill, 1995; Merrill, 1997) that was to help novice designers create better instructional materials. It guided designers through a set of decision-steps about the pedagogical aspects of instructional design that would lead to the creation of good instructional resources. During the last part of the 20<sup>th</sup> century, there were many efforts to create an “instructional designer in a box,” or at least in a computer. None of them were very successful and one likely reason for that is the focus of these systems on the pedagogical aspects of design. To this point in the development of theories of learning, there is no agreement on which one is the correct one. The same is true of theories of instruction and of instructional strategies based on a particular theory of instruction and/or learning. Without that assured foundation we need a different foundation for thinking about ID models. ID as a process is one alternative that will bring us in contact with a wider range of expertise relevant to ID and a wider range of ideas. Many students

in ID courses complete their studies without even being aware that what they have been taught as truth about ID is actually one of many different views about how ID can be practiced.

### **MOVING BEYOND THE ID PROCESS AS AN EXPRESSION OF LEARNING/INSTRUCTIONAL THEORIES**

The pedagogical or instructional focus of most ID models shapes and molds those models in particular ways. For example, many ID models require you to develop goals and objectives for instruction very early in the process and to then develop ways of assessing whether a student accomplishes those goals. This is well before the design team pays much attention to the selection of instructional strategies. This linear sequence – develop goals, create objectives, build ways of assessing the objectives, then begin work on actual instruction – is compatible with behavioral and information processing theories of learning. The sequence is not compatible with constructivist and critical theories of learning.

When pedagogy is the foundation for design, the result is typically an ID model that helps you create what your foundational theories of learning and instruction tell you are needed for good instruction. The process of ID is thus a hostage to the learning theory and the instructional theory you have pre-selected. It is very difficult, for example, to use an ID model like Dick, Carey, and Carey's (2008) to create instructional resources like online databanks for high school physics, student-centered collaborative projects, or creative writing activities for upper elementary students. That model can be used to create all sorts of direct instruction materials such as tutorials and drill and practice activities. That is because the underlying theory of learning for Dick and Carey's ID model is primarily behavioral and approaches like databanks and collaborative projects do not have a comfortable home within that family of learning theories. On the other hand, some of the constructivist instructional design models (Willis, 2009) are well suited to the creation of collaborative learning environments.

My basic argument is that we do not have definitive and verified knowledge about which theories of learning and theories of instruction are True. What we have are many different theories of learning and instruction that compete for the attention and allegiance of instructional designers, educators, schools and even states and nations. State legislative efforts to define things like the best way to teach initial reading skills, whether bilingual education is worthwhile, the status of intelligent design as a scientific theory or a religious belief, and whether multicultural education is a vast liberal conspiracy or a sensible approach to an increasingly diverse world are all examples both of how unsettled many of the core issues of education are and how many groups are sure they already know the Right Answer. And, if that were not enough, there are many fields of expertise relevant to ID that are not even considered when the focus of ID is solely on using the Right theories of learning and instruction.

With so little that is settled and with so many groups asserting that they alone have the correct answers, ID cannot be meaningfully based on pedagogy alone. ID must also be a process that helps design teams explore options and come to consensus on what to do. This means we cannot begin the process with a learning theory and instructional theory already selected – because the ID process will be based on those theories and ID will become a technical rather than a rational and thoughtful process. We need a process that acknowledges the essentially social nature of ID. However, in making this statement I am clearly taking a theoretical position. Constructivists argue that we construct our knowledge rather than discover it and that this process of constructing knowledge is a deeply social activity. Knowledge, and knowing, is a subjective, not an objective



process. Thus, in suggesting that Process ID be based on the social construction of knowledge, I am advocating ID as a *constructive-interpretive* process. However, this is not currently the dominant view of ID. The quote from Merrill and the ID2 group given earlier is another instance of defining ID from a particular theoretical perspective. It would take a very long article to unpack all the implicit but foundational assumptions and beliefs that are inherent in the definition presented by Merrill and his colleagues. To illustrate, consider the statement:

*The discipline of instructional design is founded on scientific principles verified by empirical data.*

There are at least three implicit assumptions in this statement and all of them are hotly contested in education and the social sciences today. The first is that: Human behavior is subject to scientific research that leads us to laws or law-like generalizations – expressed in theories – that are portable. They travel well from one context to another and are the most important knowledge a designer must know. An instructional designer must learn, for example, the correct instructional theories and then apply them to the particular instructional design projects he or she completes.

Many of the other design fields have moved beyond this positivist model of how we come to understand human behavior. Participatory design models, for example, are widely used to guide many software development projects. In participatory design projects, the views and opinions of end-users play a very important role in determining what is created. That is because the *process* of design makes room for end-user participation in ways that are not allowed in many traditional ID models based on a particular pedagogical foundation.

A second implicit but fundamental assumption is that: Variations from one setting to another are of little importance compared to the value of the law-like generalizations that scientific research has given us. Thus, when it comes to creating instructional materials, it is the general truths, not the local truths, that are the most important. This means the designer is an *expert* with special knowledge who must make sure that the Right theories and instructional strategies are incorporated into the material being created.

A third implicit assumption in the statement is that: As a scientific discipline, ID may not be perfect now but it becomes better and better as new scientific research tells us more and more about how people learn and how teachers should teach. Thus, ID will change over the decades and become better and better as new knowledge is added to the already substantial foundation of established truths that guide it today.

All three of these foundational assumptions are the subject of intense criticism in education, social science, and educational technology today. There is no body of scientific research that establishes even one of these assumptions. And, that brings into question the statement that “*The discipline of instructional design is founded on scientific principles verified by empirical data*” because all three of the implicit assumptions *must* be true before we can accept the general statement as even possibly true. As Bent Flyvbjerg (2001) has pointed out, the social sciences (including education) have yet to come up with a single law of human behavior that is reliable and generalizable in the way that laws in physics and chemistry are considered reliable and general. Many researchers and practitioners have had distinguished careers in educational technology that emphasized the promotion of a particular stance about which teaching and learning methods are The correct methods. The most outspoken typically criticize other methods as “unscientific.” This is not unusual in our field; most of us have done the same thing. To make progress in our field, however, we must move beyond aggressive and fundamentalist assertions that we have Science on our side – that our methods are

scientifically proven while those of groups we oppose are not. We simply do not have that type of research and may never have it. One of the reasons I say that is because the second implicit assumption noted above is also wrong. When it comes to human behavior, the local context is important. It is often more important than the general laws proposed by experts, and many of the failures of educational reform and transformation have foundered on this very point – the failure to understand the local context and how important that context is. And, if the laws proposed in decades past to guide ID are less dependable than some believe, then designers do not have such a strong hold on the title of Expert. They might better consider their role as one of facilitator and organizer than of expert. Process ID should leave many decisions to the design team as a social group engaged in discourse about important decisions that should be made on the basis of local, contextual knowledge as well as what we learn from studying what others have already done. And, because each instructional design project is unique in many ways, the process of negotiating meaning should be part of each project. We should not take anything for granted – whether it be the truth of constructivist instructional theory or the value of distance education in high schools. There is much more in the literature about this particular issue and it is up to all of us as participants in the ongoing and extensive dialog to make up our own mind about what we find usable and workable.

The idea that ID is a discipline based on results of scientific research has also been questioned by other educational technology scholars, including Thomas Reeves (2000) at the University of Georgia. A respected and widely read scholar, Reeves commented on the position paper by Merrill and his colleagues this way:

Not everyone in or out of academe shares Professor Merrill's positive assessment of instructional design as a scientifically valid technology. . . . There is an enormous gap between Merrill's identification of instructional design as a robust technology derived from the science of instruction and Resnick's conclusion that instructional design is a field that does not seem to contribute to the solution of educational problems.

The Resnick Professor Reeves refers to is Lauren Resnick from the University of Pittsburgh. He quoted from her 1999 AERA discussion after a presentation:

We don't have a well-developed design field in education. . . . I've looked around at the field called instructional design in which people can get degrees, and so far have not been interested in hiring any of the people with those degrees who have crossed my path. Just didn't look like they were going to add much.

Reeves goes on to point out that many other scholars, in our field and outside the field, have very little confidence in ID and educational technology research in general.

### **WHY ADOPTING PROCESS AS THE CORE OF ID IS IMPORTANT**

Thinking of ID primarily as a matter of making the correct pedagogical decisions is too limiting and it has not brought ID into wide use or wide acclaim. It assumes that there is a "correct" choice that is generalizable and relatively universal. As noted earlier, this assumption has been the foundation for much of the theoretical and empirical work in the area of instructional design. Over twenty years ago Tennyson and Cocchiarella (1986) published a paper in the *Review of Educational Research* titled "An Empirically Based Instructional Design Theory for Teaching Concepts." In it they described what

they considered a thoroughly validated set of directions for teaching conceptual information. While the conclusions of this paper were presented as law-like knowledge that can be widely applied to ID work it was not the definitive statement on concept learning. Today, when this paper is read it becomes quickly obvious that the effort to define the correct pedagogy was an expression of a particular family of learning theories, especially those from cognitive science. By 1990 Tessmer, Wilson, and Driscoll were writing about a new model for teaching concepts. And, by 2004, Gulman, while advocating the use of constructivist approaches to concept learning, concluded that the approaches he recommended were more effective than those presented by Tennyson and Cocchiarella 18 years before.

I am not arguing that as instructional designers we should ignore the research efforts of scholars like Tennyson and Cocchiarella. Instead, I suggest that such work be conducted, and used by others, in a different way. Such studies do not lead us to definitive laws of learning. Instead, they represent the efforts of experienced colleagues to better understand particular types of teaching and learning in particular contexts. The results are not laws of behavior that can be applied blindly. Instead, the results, and the reflections of the researchers, are potential sources of influence on our practice. As a design team works on the creation of instructional resources for a particular context, the work of Tennyson and Cocchiarella is one among many worthwhile sources of influence. However, opposing views and perspectives are also worthy of consideration and the final decision about how to design a particular instructional resource should be up to the design team. That approach calls for a different foundation for ID.

If we cannot progress using Pedagogy ID models, we must select another foundation. Process is one of those possible foundations. Process ID models focus on how to design instructional resources. They do not necessarily begin with a particular theory of instruction – that must be decided by the design team. However, most process models (Willis, 2009) are based on several assumptions that come primarily from constructivist theories of teaching and learning:

- Learning is a social process that involves creating local meaning through interaction. ID is a form of learning.
- Local context often overwhelms universal laws and rules.

I sometimes find it surprising that for at least the past 30 years the educational literature has been filled with the assertion that “learning is a social process” but when it comes to the design of learning environments that emphasize the social nature of learning, we often use design models that seem to ignore the fact that if learning is social then design is also social. If we take the social nature of learning seriously, ID calls for a design team that is engaged in the exploration of the possibilities for creating powerful learning tools and resources. Much of the Pedagogical ID literature is based on the idea that instructional designers are experts with special knowledge about how to teach different subjects. These expert-centered models often put other members of the design team in secondary roles that serve the instructional designer. If, like the emperor, the instructional designer has no Expert clothes, this makes little sense. Some ID models seem to have been immune to the influence of strong movements in education such as collaborative learning, learning communities, co-construction of knowledge, co-design, informant design, participatory design, and student-centered design. All these efforts, and many others, are based on the assumption that involving end users, consumers, students, teachers, community members, and other “stakeholders” in design projects will lead to better products. (For an introduction to several ID models based on process see Willis, 2009.) Rather than starting with a set of rules and laws about what instruction should be like, the instructional designer begins with an assumption that the process of designing instruction should be open, flexible, and participatory. These are all about

process rather than pedagogy. Certainly, pedagogy is a very important aspect of the design process but process models of ID do not begin with decisions already made about what theories of pedagogy will be used. Those decisions are not made by an expert who knows more universal knowledge about pedagogy than the other members of the team. Instead, they are made by the participants, the design team, that may be made up of teachers, trainers, parents, students, instructional designers, technology specialists, and others. This group is a reservoir of local and contextual knowledge as well as technical expertise about both information/instructional technologies and teaching and learning. Although she did not refer to it as Process ID, Häkkinen (2002) noted this shift in emphasis, “The ideas of participative or participatory design are no longer new concepts in systems design. . . . Furthermore, there have been discussions of cooperative design. . . Designers need to look beyond the object and engage more closely in the social contexts of use . . . . They need to respond to communities of users, the negotiations members undertake and the genres they develop” (p. 466). I could not agree more. Today the complex process of creating a wide range of diverse, interesting, and useful instructional materials calls upon us to think more seriously about the processes of instructional design. However, the shift from Pedagogical ID models to Process ID models may be slow because the shift involves giving up some forms of certainty – for example, that a particular theory of learning is the best or correct one – and also giving up some forms of control – for example, that the instructional designer is an expert with special knowledge to share with other members of the design team who play support roles in the design process. Process models of ID often put the instructional designer in the role of facilitator and organizer rather than the expert whose opinions must be obeyed. That these more structured and top-down models are actually part of some worldviews or paradigms, such as positivism, does not help. Shifting perspective on the foundations for ID calls for rethinking our paradigms, our view of theories of learning, our willingness to work across rather than within different instructional theories, and our comfort with the use of many different instructional strategies rather than just one family of strategies. It also requires us to give up some certainties, and some power, to encourage wider participation and involvement in the design process.

One indication that concern about process is growing in the field of ID is the work of some established scholars who helped create the history of ID over the past quarter century or more. For example, in his discussion of the possibilities of Automated Instructional Design (AID), Charles Reigeluth (1993) pointed out that if an AID system is to work “it must incorporate knowledge about both process and product” (p. 43). Reigeluth’s product knowledge is essentially what I have been calling Pedagogical ID. His use of the term process is essentially the same as mine but in his paper he describes it relatively traditionally. Reigeluth’s emphasis on the need to consider process in any effort to automate the ID process is an indication of how important he considers process. I applaud his concern. However, because I consider the local context to be very important in designing instruction and because I consider the design process very social and participatory, I have little hope that an Automated Instructional Design system will one day replace the work of design teams made up of interacting, engaged humans who represent a variety of areas of expertise and experiences as well as a variety of perspectives and viewpoints.

## REFERENCES

- Bennett, S., Harper, B., & Hedberg, J. (2002). Designing real-life cases to support authentic design activities. *Australian Journal of Educational Technology*, 18(1), 1-12. Available: <http://ascilite.org.au/ajet/ajet18/bennett.html>

- Cline, R. W., & Merrill, M. D. (1995). Automated instructional design via instructional transactions. In Robert D. Tennyson & Ann E. Baron, (Eds.), *Automating instructional design: Computer-based development and delivery tools* (pp. 317-353). New York: Springer-Verlag
- Dick, W., Carey, L., & Carey, J. (2008). *The systematic design of instruction* (7<sup>th</sup> ed.). Boston: Allyn & Bacon.
- Flyvbjerg, B. (2001). *Making social science matter: Why social inquiry fails and how it can succeed again*. Cambridge, UK: Cambridge University Press.
- Gulman, J. (2004). Mapping of constructivist acquisition of concepts. In P. Kommers (Ed.), *Support for Learning* (pp. 33-46). Amsterdam: IOS Press.
- Häkkinen, P. (2002). Challenges to design of computer-based learning environments. *British Journal of Educational Technology*, 33(4), 461-469.
- Locatis, C., & Park, O. (1992). Some uneasy inquiries into ID expert systems. *Educational Technology Research & Development*, 40(3), 87-94. (EJ 462 856)
- Merrienboer, J. (1999). Cognition and multimedia design for complex learning. Amsterdam: Open University of the Netherlands. Retrieved December, 20, 2009 from <http://lnx-hrl-001.ou.nl/bitstream/1820/1615/1/Jeroen%20van%20Merrienboer%20oratie.pdf>
- Merrill, M. D., & ID2 Expert Group (1996). Instructional transaction theory: Instructional design based on knowledge objects. *Educational Technology*, 36(3), 30-37. (EJ 524 804)
- Merrill, M. D. (1997). Learning-oriented instructional development tools. *Performance Improvement*, 36(3), 51-55. (EJ 544 730)
- Reeves, T. (2000). Enhancing the worth of instructional technology research through “design experiments” and other development research strategies. Paper presented at Annual Meeting of the American Educational Research Association, New Orleans, LA. Retrieved June 12, 2007 from <http://it.coe.uga.edu/~treeves/AERA2000Reeves.pdf>
- Reigeluth, C. (1993). Functions of an automated instructional design system. In M. J. Spector, M. Polson, & D. Muraida (Eds.), *Automating instructional design: Concepts and issues*, (pp. 43-58). Englewood Cliffs, NJ: Educational Technology Publications.
- Tessmer, M., Wilson, B., & Driscoll, M. (1990). A new model of concept teaching and learning. *Educational Technology Research and Development*, 38(1), 45-53.
- Tennyson, R., & Cocchiarella, M. (1986). An empirically based instructional design theory for teaching concepts. *Review of Educational Research*, 56(1), 40-71.
- Willis, J. (2009). *Constructivist instructional design (C-ID)*. Charlotte, NC: Information Age Publishers.