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INSTRUCTIONAL-DESIGN THEORIES AND MODELS, VOLUME IV

The Learner-Centered Paradigm of Education

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How to help people learn better. That is what instructional theory is all about. It describes a variety of methods of instruction (different ways of facilitating human learning and development), and when to use—and not use—each of those methods.

Volume I of *Instructional-Design Theories and Models* (1983) provides a “snapshot in time” of the status of instructional theory in the early 1980s. Its main purpose was to raise awareness of instructional theories, which were largely overlooked in the shadows of ADDIE and other ISD process models. Most of the theories are classics and are still very useful today.

Volume II (1999) provides a concise summary of a broad sampling of work in the late 1990s on a new paradigm of instructional theories for the Information Age. Its main purpose was to raise awareness of the diversity of theories that provide a customized or learner-centered learning experience in all different domains of human learning and development. It also raised awareness of the importance of values in instructional theory.

Volume III (2009) was born out of a concern about the extent to which instructional theorists seemed to be working in relative isolation from each other, building their own view of instruction with little regard to building on what knowledge already existed and what terminology had already been used for constructs they also describe. Therefore, Volume III took some early steps in building a common knowledge base about instruction with a common use of terms. It also described some tools for continuing to build a common knowledge base.

These three volumes cover very different territory. None of them was intended to replace its predecessors. We have made a conscious effort to keep duplication to a minimum, so readers interested in mastering the art and science of designing powerful instruction will benefit from all of them. Each volume includes chapter forewords that summarize their main contributions, to give readers a quick sense of whether or not a chapter addresses their particular interests and needs.

**Why a Volume IV?**

Our initial thought was to conclude this series with Volume III. However, new instructional methods are continually developed as advances are made in brain sciences, information technology, and other relevant fields. Furthermore, as we have evolved deeper into the Information Age, it has become clear that a change in the paradigm of instruction from teacher-centered to learner-centered requires parallel changes in aspects of education and training systems that are technically beyond the scope of theories of instruction.1

Using systems thinking, we recognize that the learner-centered paradigm of instruction is closely interrelated with different paradigms of instructional management, assessment, and even curriculum. First, regarding instructional management, truly learner-centered instruction requires student progress to be based on learning rather than on time. This is an instructional management strategy as defined in Chapter 1 of Volume I (p. 8), and has consequently not been addressed by instructional theories. Second, regarding assessment, truly learner-centered instruction requires student learning to be compared to a standard of achievement (criterion-referenced—to know when the learner is ready to move on) rather than to the learning of one’s peers (norm-referenced) and consequently should be integrated with the instruction rather than being a separate activity. Third, regarding curriculum, truly learner-centered instruction requires decisions about what to learn that are responsive to student needs in a society that is much more complex than that of our Industrial-Age forebears.

In sum, decisions about what to teach, how to teach it, and how to assess it must all be dramatically different now compared to those that were appropriate for the Industrial Age, and those decisions should be made together because they are interdependent. That interdependency has not been addressed in Volumes I–III, but it is addressed here in Volume IV. This Volume provides a coherent, comprehensive set of guidelines for the learner-centered paradigm of education and training that addresses curriculum and assessment, as well as instruction, because effective design must address all three simultaneously.

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1 For an explanation of the urgent need for paradigm change in education and training from teacher-centered to learner-centered and from time-based student progress to learning-based student progress, see Chapter 1 in Volume II (pp. 16–21), Chapter 1 in Volume III (pp. 13–17), and Chapter 1 in Reigeluth and Karpoff (2013).
Challenges with the Learner-Centered Paradigm

Perhaps the greatest challenge with implementing the learner-centered paradigm of education and training is the difficulty that instructional theorists, researchers, educational policymakers, and practitioners face in transcending Industrial-Age mental models or mindsets about instruction in both education and training contexts. It is hard for us to conceive of schools and universities without grade levels, without courses, without tests, without grades, and without terms or semesters (Reigeluth & Kampp, 2013). To implement the learner-centered paradigm effectively, many stakeholders must come to understand education in a very different way from traditional mental models.

Another challenge with implementing the learner-centered paradigm is the difficulty of transforming Industrial-Age systems, which are designed to make change extremely difficult. If piecemeal reforms are difficult within such a highly politicized and bureaucratic system, paradigm change is an order of magnitude more difficult. It is like trying to transform a railroad system into an air transportation system. It requires fundamental changes in all parts of the system, or at least enough parts to reach the tipping point where more pressure is exerted by the new parts to change the remaining old parts, than the old parts exert on the new ones to change back. This means that the transformation process is much more expensive and time-consuming than are piecemeal reforms, but there is good evidence that the new paradigm will be less expensive than the current one (Egol, 2003; Reigeluth & Kampp, 2013). The good news is that much is known about an effective process for transforming existing school systems on the school, district, and state levels, and there are already hundreds of schools that exhibit many features of the learner-centered paradigm, to serve as examples of what can be (see Reigeluth & Kampp, 2013).

About this Volume

The primary audience for this volume, like that of the previous three volumes, is instructional theorists, researchers, and graduate students. An additional audience is instructional designers, teachers, and trainers who are interested in guidance about how to design instruction of high quality.

In Unit 1, Chapter 1 provides the top-level description of design theory for the learner-centered paradigm. Chapters 2-5 provide the first level of elaboration on that top-level description, with chapters on competency-based education, task-centered instruction, personalized instruction, and a new paradigm of curriculum. Unit 2 offers the second level of elaboration, with chapters on maker-based instruction, collaborative instruction, games for instruction, instruction for self-regulated learning, instructional coaching, and technology for the learner-centered paradigm. Finally, Unit 3 provides descriptions of steps toward the LCE paradigm— instructional designs that can be done within the constraints of the Industrial-Age paradigm—including instruction for flipped classrooms, gamification in instruction, considerations for mobile learning, and just-in-time teaching.

We have tried to make it easier for the reader to digest the instructional theories in this Volume by preparing the same kind of unconventional foreword for each chapter as was done for Volumes II and III. Each chapter foreword outlines the major ideas presented in the chapter. This offers something akin to a hypermedia capability for you to get a quick overview of a chapter and then flip to parts of it that particularly interest you. It can also serve preview and review functions and make it easier to compare different theories. We have also inserted editors’ notes in most chapters to help you relate elements in a chapter to similar ideas presented in other chapters. Finally, there is a unit foreword that introduces the chapters in each unit.

It is our sincere hope that this Volume will help instructional theorists and researchers to further advance knowledge about the learner-centered paradigm of education and training. We also hope it will help policymakers and foundations to support transformation to the new paradigm. Finally, we hope this Volume will help instructional designers, teachers, and trainers to implement learner-centered practices in their educational and training systems.

- C.M.R., B.J.B., & R.D.M.

References

UNIT 1

Fundamental Principles of the Learner-Centered Paradigm of Education

Unit Foreword

Unit 1 provides a broad yet shallow view of the learner-centered paradigm of education and training. Chapter 1 presents an "epitome" of design theories for this emerging paradigm. Because decisions about how to teach in this paradigm are inextricably intertwined with decisions about how to test and even with decisions about what to teach, this chapter describes design principles for all these aspects of education and training. Chapters 2–5 then present an elaboration on the principles in Chapter 1, and Unit 2 provides yet another level of elaboration.

The learner-centered paradigm is characterized by far more variations than is the teacher-centered paradigm. As theorists attempt to provide more detailed guidance, we find that there are alternative ways (methods) to implement a general principle, and that different ways are preferable in different situations. We therefore asked all authors to describe situational principles as well as universal principles. Also, since design principles are goal-oriented and thus normative, they are based on values. Methods should often vary as one's values vary, so we asked all authors to describe the values that underlie their design theories. In sum, all authors were asked to address the following in their chapters: 1) introduction, including definitions, importance, and underlying descriptive theories, 2) values upon which their design theory is based, 3) universal principles or methods for their design theory, 4) situational principles for their design theory, 5) implementation issues or case description, and 6) conclusion or closing remarks.

In Chapter 1 Reigeluth, Myers, and Lee present a comprehensive vision of the learner-centered paradigm of instruction, a vision founded on the idea
that the current paradigm of instruction—now more than a century old—is no longer appropriate to meet the learning needs of individuals or society. The Industrial Age conception of education as a process of mass production—in which learners all study the same thing at the same time and are assessed in the same way—is no longer adequate in the Information Age. The 21st century is a time of accelerating change, rapidly accumulating knowledge, and dramatically increasing access to that knowledge. Rote memorization and standardized testing are resulting in students whose knowledge and skills are practically obsolete upon graduation. We need graduates who are equipped to embrace change, who are prepared to make sense of the vast amounts of information at their fingertips, and who are curious and eager to communicate, collaborate, innovate, and create new knowledge. To help all learners succeed, the authors describe the learner-centered paradigm as being attainment- (or competency-) based rather than time-based, task-centered rather than content-centered, and personalized rather than standardized. This requires changed roles for the teacher, the learner, and technology. It also requires a different paradigm of curriculum, one that is fundamentally structured around effective thinking, acting, relationships, and accomplishment.

In Chapter 2, Voorhees and Voorhees elaborate on the attainment-based nature of the learner-centered paradigm. They address the nature of competency statements, which are largely related to learning goals and criteria for their attainment. They address sequencing and structuring of competencies to accelerate learning, principal among which is basing learner progress on mastery rather than time. And they devote considerable attention to student assessment, which should measure individual skills and knowledge, be criterion-referenced with predefined rubrics, be performance-based, be personalized with student input on their design, and much more. The authors also address the importance of a system to keep track of the competencies that each student has mastered and a system for constantly evaluating and improving the instruction and assessments.

In Chapter 3, Francom elaborates on the task-centered nature of the learner-centered paradigm. Based on Merrill's "first principles of instruction," he offers guidance for 1) selecting, sequencing, and scaffolding tasks, 2) activating prior knowledge, 3) demonstrating performance of skills (or part-tasks) and providing procedural and supportive information, 4) having learners apply those skills and procedural and supportive information, and 5) providing opportunities for the learners to integrate what they have learned and explore new ways to use it.

In Chapter 4, Watson and Watson elaborate on the personalized nature of the learner-centered paradigm. Their design principles offer guidance for personalizing each student's long- and short-term instructional goals, creating a personal learning plan for each student, and keeping detailed records of each student's progress. Guidance for personalizing the task environment addresses selecting tasks that are of great interest to the student as well as relevance to the learning goals, and deciding whether tasks should be done individually or collaboratively. Principles for personalizing scaffolding for the task address adjusting the quantity and quality of scaffolding to the student's self-regulation skills and developmental needs. Principles for personalizing assessment include guidance for deciding how to assess both task performance and mastery of individual attainments. And guidance for personalizing reflection address when and how a student should reflect on both the learning process and task performance.

In Chapter 5, the last chapter in Unit 1, Prensky elaborates on the nature of curriculum for the learner-centered paradigm. He describes a truly different paradigm of curriculum, one designed to prepare all people for a useful and successful life. It has some of the content from the current curriculum, which is organized around the four main subjects of Math, English, Science, and Social Studies (MESS), but it totally reorganizes them under the four main subjects of thinking effectively, acting effectively, relating effectively, and accomplishing effectively. He describes many sub-skills for each of these four main subjects, and he describes how traditional subject areas are needed as vehicles for learning them. It is our view that the four new subjects are equally relevant for K-12 education, higher education, and corporate and government training.

In Unit 2 this fairly general set of design theories is elaborated for more detailed and varied guidance about what methods to use and when to use them in the learner-centered paradigm of education and training. Then Unit 3 offers design theories that are intended for use in the teacher-centered paradigm as steps toward the learner-centered paradigm.

-- C.M.R., B.J.B., & R.D.M.
passions, and applying them to life through real-world accomplishments will be a better approach than focusing everyone on MESS.

One thing we can say with certainty is that this will not harm our kids. It will clearly benefit many—and I believe all.

**The Goal of Education**

Underlying our need to change the curriculum is a new—or revised—understanding, not just of our changed context, but of what education is for in our society—what its goal is.

If asked “What is the goal of education?” many would answer it is “learning.” “Learning” is what we try to measure in our assessments. We often refer to our students as “learners.” Almost all the books found in the “education section” of bookstores today—online and off—are about some type or method of “learning.”

But learning is not the real goal of education—certainly not any more. Today “learning” is only a means to the real goal of education, which is “becoming”: becoming a good, capable, and flexible person, who will help make the world a better place.

“Becoming” is—or should be—the real goal of education in the world, the goal we pass on to our children. And until everyone realizes this, accepts it, and acts on it, much of the huge amount of time and money the world now spends on education will remain, essentially, wasted.

It is my great hope that by moving to something like the new curriculum described here, and by focusing our young people, therefore, on the “true” basics of Effective Thinking, Effective Action, Effective Relationships, and Effective Accomplishment, acquired through individual passions and applied to helping the world—rather than focusing kids on what we teach kids today—the world will take giant steps toward the goal of effectively educating all its people and, therefore, toward making the world a better place for all of us, and our posterity, to live.

**References**


**UNIT 2**

**More Detailed Designs for the Learner-Centered Paradigm**

**Unit Foreword**

In Unit 2 we present five instructional designs that elaborate on the fundamental principles of learner-centered instruction in a variety of educational settings across K-12 and higher education. Each of these designs incorporates one or more of the five universal learner-centered design principles described in Chapter 1, but none of them incorporates all. We’ve also included a chapter at the end of Unit 2 that describes the design of a Personalized Integrated Educational System (PIES) that would provide the technology backbone to support a truly learner-centered instructional system that implements all five universal learner-centered design principles. Though PIES has not yet been built as an integrated whole, as you read this chapter you should recognize several components that do already exist in disparate systems and some components that may yet need to be created.

Unit 2 begins with **Chapter 6, Designing Maker-Based Instruction**, by McKay and Glazewski. The authors describe maker-based instruction, an approach which facilitates students building meaningful artifacts to achieve learning goals and demonstrate understanding of content. The authors explain how maker projects can not only help students learn production and design-oriented skills, but also create opportunities for students to produce an artifact both meaningful and personally valuable; the meaning and value come from the making process itself. This approach implements such learner-centered principles as attainment-based instruction, task-centered instruction, personalized instruction, and changed roles. The extent to which each principle is implemented depends on the specific design decisions, instructional context, and other important factors present in the educational setting.
In Chapter 7, Designing Collaborative Production of Digital Media, Kalitzidis, Lits, and Halverson describe a “New Literacies” perspective on instructional design and explain its implementation in an instructional environment that engages learners in collaborative, creative, interest-driven, and production-oriented digital media projects. This active learning approach implements such learner-centered principles as attainment-based instruction, task-centered instruction, and personalized instruction. In this design, also, the extent to which each principle is implemented depends on the specific design decisions, instructional context, and other important factors present in the educational setting.

In Chapter 8, Designing Games for Instruction, Myers and Reigeluth describe a game-based approach to instruction that promotes learning in rich, immersive, simulated, problem-oriented environments designed to challenge learners in multiple ways. The authors state that this approach implements “learning by doing” in a social environment and leads to deeper learner engagement, which elicits greater learner effort and ultimately results in improved student learning. This approach generally implements such learner-centered principles as attainment-based instruction, task-centered instruction, personalized instruction, and changed roles. The extent to which each principle is implemented depends on the specific game design decisions, and other important factors associated with the encompassing instructional system (students, instructor, school, home environment, etc.).

In Chapter 9, Designing Instruction for Self-Regulated Learning, Huh and Reigeluth describe why supporting self-regulation in learners is of even greater importance now, in the Information Age, than ever before, and how instruction can be designed to improve learner self-regulation. As learners take on more active roles in all forms of learner-centered instruction (such as those described in this volume), the ability to self-regulate learning is critical for the development of effective lifelong learning skills. The design explained in this chapter is intended to help learners assume more ownership for, take control of, and find ways to customize (personalize) their own learning experience to better fit their own needs and goals. The details of a specific implementation will determine how significantly such learner-centered principles as attainment-based instruction, task-centered instruction, personalized instruction, and changed roles are supported.

The final chapter in Unit 2 that describes an existing instructional design is Chapter 10, Designing Instructional Coaching, by Knight, Hock, and Knight. The authors describe an instructional design that changes the traditional teacher-learner relationship to one modeled after a classic coaching approach. The specific design context of this chapter is teacher mentoring and professional development (with classroom teachers taking on the role of learners), but the principles apply to many other instructional settings. As explained by the authors, in the instructional coaching design, goal setting, questioning, and data gathering (typical of one-to-one coaching) are integrated with explanation, modeling, and feedback to help teachers teach more effectively and improve student learning. This approach implements such learner-centered principles as attainment-based instruction, task-centered instruction, personalized instruction, and changed roles. The extent to which each principle is implemented depends on the specific design decisions, instructional context, and other important factors present in the educational setting.

In the last chapter in Unit 2, Chapter 11, Designing Technology for the Learner-Centered Paradigm of Education, Reigeluth does not present an existing instructional design, but rather describes design features of a proposed system, PIES, that would provide the technological support for truly learner-centered instruction as we’ve described it in Chapter One. The authors explain four major functions required to support students’ learning (recordkeeping for student learning, planning for student learning, instruction for student learning, and assessment for student learning) and three secondary functions (communication and collaboration, PIES administration, and improvement of PIES). If developed fully, this approach would support the implementation of all five learner-centered principles: attainment-based instruction, task-centered instruction, personalized instruction, changed roles, and changed curriculum.

As in Unit 1, at the outset of each chapter, we provide a summary of the key elements of each instructional design, highlighting important contextual factors and listing instructional values, universal design principles, situational design principles (when included by authors), and implementation considerations. In several chapters, the authors have also provided helpful summary tables to aid your understanding and provide a useful resource for later reference.

As you read these chapters, you might find that you are familiar with various aspects or elements of these designs, having experienced them as a student or instructor in the past. You might also think about ways that you could adapt one or more of these designs to fit your own specific educational setting. We encourage you to think creatively as you reflect on your own experiences and consider the possibilities for further personal and professional application of each design.

— C.M.R., B.J.B., & R.D.M.
UNIT 3
Steps Toward the Learner-Centered Paradigm

Unit Foreword

As described in the chapters in Unit 1, student progress in the learner-centered paradigm should be based on learning rather than on time spent learning, should require the performance of authentic tasks, and should be personalized based on the learner’s goals, interests, preferences, and prior learning. This paradigm shift requires changed roles for instructors, learners, and technology; and it requires a changed curriculum that is expanded to encompass emotional and social development and is restructured around effective thinking, acting, relating, and accomplishing.

The four chapters in Unit 3 present some emerging instructional-design theories that reframe where and how instruction and learning take place, focusing in particular on learning that happens outside the classroom and how it can be tied to in-class instruction. Because these approaches are all working on (or perhaps more precisely, trying to work around) the current paradigm of content-focused and time-bound instruction, we see these as steps toward the new paradigm, attempts to employ some of the learner-centered principles to disrupt the current system from within.

In Chapter 12, *Designing Instruction for Flipped Classrooms*, Strayer prescribes the use of out-of-class tasks in which learners examine real-life information to initiate construction of knowledge and provide responses that the instructor then uses to guide in-class activities. Time is spent on shared reflection and on tasks that address learners’ questions and misunderstandings and require learners to grapple with non-routine problems, communicate their thinking, and critique the reasoning of others. Flipped classroom instruction seeks to optimize the time that instructors and students spend with each other by making
better use of the time they spend apart. As a result, students must take greater responsibility for their learning by preparing for class and participating fully in class activities. Strayer says that the universal principles of flipped classroom instruction are compatible with a variety of instructional approaches, and to demonstrate he provides situational principles for a direct instruction approach and a problem-based instruction approach.

In Chapter 13, *Gamification Designs for Instruction*, Kapp describes an approach to reimagining the content and structure of instruction to create and maintain student engagement and motivation. As with Strayer's flipped classroom instruction, Kapp emphasizes learning done outside the classroom, which is tracked and rewarded using computer-based technology. Content gamification is intended to generate intrinsic motivation and to foster feelings of autonomy, competence, and relatedness. Instructors can gamify content by incorporating game elements such as story, challenge, characters/avatars, mystery, and so forth. Gamification of course structure is intended to provide reinforcement and extrinsic motivation over longer periods of time. Instructors can gamify course structure by providing recognition for attainments in the form of points, badges, trophies, and so forth, and by maintaining a leaderboard. Gamification would seem to work well with personalization of instruction as one could imagine a course with multiple content paths that learners could navigate at their own pace.

In Chapter 14, *Design Considerations for Mobile Learning*, Cochrane and Narayan present principles for bridging formal and informal learning contexts by leveraging the affordances of mobile devices. Their instructional-design theory is founded on providing authentic learning experiences in which students must re-conceptualize their role from passive reproducers of knowledge to active participants in learning communities. Projects are largely student-directed and require students to use tools on their mobile devices to communicate, collaborate on multimedia production, and share their creations with the public. Students and teachers together negotiate assessment activities, and teachers provide an ecology of resources to guide and support learning.

In Chapter 15, *Designing Just-in-Time Instruction*, Novak and Beatty describe an inductive approach to pedagogy that shares characteristics with the flipped classroom approach described in Chapter 12. Both approaches begin with out-of-class work designed to prepare learners for active learning in the classroom, and both prescribe adapting in-class activities based on learners' pre-class responses. The just-in-time approach provides more guidance regarding the pre-class activities with universal principles related to the design of whole-authentic tasks that are sequenced in increasing complexity and provide sufficient variability to promote construction of general schemas. The situational principles cover variations in methods based on pedagogical strategies and discipline-dependent thought processes.

As in Units 1 and 2, at the outset of each chapter we provide a summary of the key elements of each instructional design, highlighting important contextual factors and listing instructional values, universal design principles, situational design principles (when included by authors), and implementation considerations.

The four chapters in this unit present instructional-design theories intended to work within the current paradigm of instruction while employing some of the learner-centered design principles discussed in Unit 1. They all share an emphasis on making better use of the time learners spend outside the classroom. As you read these chapters, you might consider other ways in which instructional designers and teachers can use available technologies to take steps toward the learner-centered paradigm of instruction.

— C.M.R., B.J.E., & R.D.M.