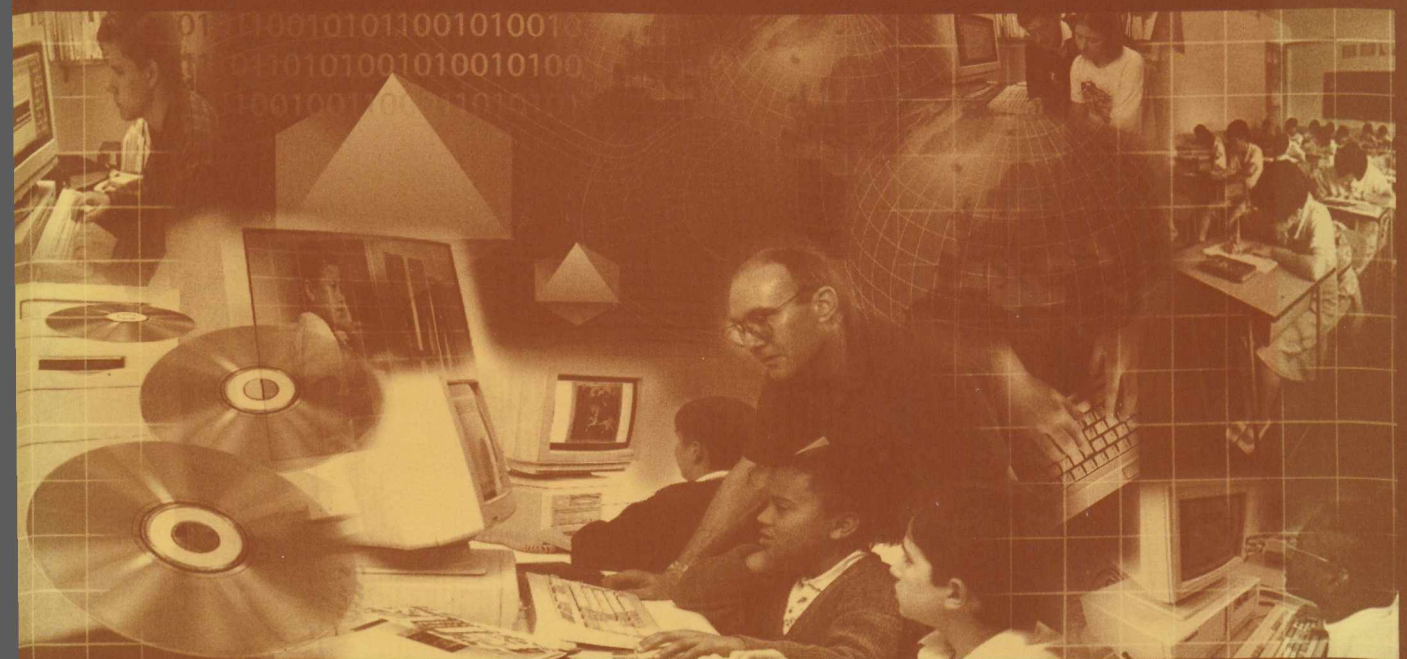


INTERNATIONAL  
**Encyclopedia**  
OF  
EDUCATIONAL  
TECHNOLOGY

SECOND EDITION

Edited by:  
TJEERD PLOMP  
DONALD P. ELY



## Course Design

J. W. M. Kessels and T. Plomp

In this entry, "course design" is the term used for the tactical planning process that is positioned between the large-scale strategic level of curriculum development and the small-scale operational level of instructional design. On this tactical level, the main goals from the overall curriculum development outcomes are organized in courses, that is, in comprehensive entities of objectives, assessment instruments, and instructional strategies and materials. This planning process involves analysis of the specific needs, the analysis of favorable and inhibiting conditions for implementation, and the selection and application of instructional theories. The aim of this entry is to review the concepts and approaches to course design as well as their application in formal and corporate education.

Although it sounds plausible to make clear distinctions between curriculum development, course design, and instructional planning, practice does not show such clear separations and unambiguous definitions. Gentry's book *Introduction to Instructional Development* (Gentry 1994) focuses on course design. Romiszowski's *Designing Instructional Systems* (Romiszowski 1981) applies to curriculum development (Level 1 design), course design (Level 2 design), and to instructional planning (Level 3 design). Rothwell and Kazanas (1992 p. 4) state that the chief aim of instructional design is to improve employee performance so as to increase organizational efficiency and/or effectiveness. This general aim would apply to the more strategically used concept of curriculum development. However, the instructional planning process they actually describe fits the concept of course design, as well as what has been indicated as instructional design on the operational level. Posner and Rudnitsky's book is titled *Course Design: A Guide to Curriculum Development for Teachers* (Posner and Rudnitsky 1986). In fact, their guide helps teachers to plan instruction that gears toward intended learning outcomes on the operational level. These examples show the variety of terms used and how the various authors attribute different meanings to these terms. Differences in opinion about how the learning process takes place in the individual can be reflected in the approaches to curriculum development, course design, and instructional planning. As a course is an educational solution to a problem, or an educational answer to a question, it is of great interest how the designer perceives the learning process that makes part of that solution or answer. In the following sections a variety of these perceptions and their related approaches are discussed.

### 1. Approaches to Course Design

We will review the following approaches: a systematic approach (Tyler), a deliberative approach (Walker), an artistic approach (Eisner), a cognitive approach (Posner), and a constructive approach (Winn). In a separate section, elements of the various approaches are combined and applied to course design in a corporate setting.

#### 1.1 A Systematic Approach

The systematic approach to course design follows directly from the work of the prominent American curriculum scholar Tyler. He was invited to construct a comprehensive outline of the questions to be answered and the steps to be taken in developing a monumental curriculum project including the program of instruction. What later became known as the "Tyler rationale" (Tyler 1949) started as a framework to guide the efforts of participating schools in their development of new curricula. Tyler (1966) states: "As the project began, the schools encountered great difficulty in identifying the problems to be attacked and in organizing and assigning task forces to work on these curriculum projects. There seemed to be little in common among the schools in their uses of terms, in the emphasis given to the subject fields, to student needs, and to social demands, and there was no clear-cut way in which the educational philosophies of the schools and theories of learning were considered." These conditions led to the original statement of the four divisions of curriculum inquiry (Tyler 1949).

1. What educational purposes should the school seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine whether these purposes are being attained?

For gathering information on the objectives (Question 1), Tyler recommends the following sources: studies of the learner (individual), studies of contemporary life (society), and suggestions from subject specialists (content), along with employment of a philosophy of education and a theory of learning. The specific emphasis on stating objectives (Question 1) grew out to an expanding culture of behavioral statements on learning outcomes. Long before Tyler

formulated his rationale, it was among others Bobbitt (1918 pp. 42–43) who drew attention to the analysis of what is needed in educational systems: “The curriculum-discoverer will first be an analyst of human affairs . . . . This requires only that one go out into the world of affairs and discover the particulars of which these affairs consist.” The systematic and analytical approach to course design, as advocated by Bobbitt and Tyler, has led to design procedures that are still dominant and that heavily rely on needs assessment, task analysis, stating instructional objectives, matching assessment instruments, and devising appropriate instructional strategies. Programmed instruction and computer-assisted instruction probably would not have come to development without the founding work of Tyler. Authoritative course design procedures that stem from Tyler’s rationale are among others Taba’s *Curriculum Development: Theory and Practice* (Taba 1962), Briggs’ *Instructional Design: Principles and Applications* (Briggs 1977), Tracey’s *Designing Training and Development Systems* (Tracey 1984), Dick and Carey’s *The Systematic Design of Instruction* (Dick and Carey 1990), and Branson and Grow’s *Instructional Systems Development* (Branson and Grow 1987). The initial four questions of the Tyler rationale have been elaborated upon and developed into impressive volumes of design procedures. The logical and rational step-by-step approach, including the iterative use of feedback from formative evaluation, is characteristic of most of these systematic design procedures.

### 1.2 A Deliberative Approach

In practice, course design often does not show the step-by-step approach as advocated in the previous section. Walker (1971, 1990) observed many course planners and identified three basic planning phases: platform, deliberation, and design. On the basis of these findings, he developed a framework for the process of curriculum planning for which he used the term “naturalistic model.” This model is not a model of how course design should take place, but how it occurs in reality when planners meet and try to put together the elements for successful learning events. In the “platform phase,” participants talk, discuss, and argue about their beliefs, “conceptions,” theories, aims, images, and potential procedures concerning the project. When a group achieves clarity and consensus about these constituent elements of the platform, they move into the phase of deliberation. Walker’s model specifies that the process of deliberation includes identifying relevant facts, generating alternative courses of action in light of precedents, considering the costs and consequences of all alternatives, and choosing the most defensible alternative. The platform and deliberative phases involve intensive exchanges of ideas and beliefs. Reaching consensus is essential

for moving into the design phase. However, reaching consensus can become an extremely difficult task, especially when participants hold to their adversative beliefs, or when they do not survive the frustration of emerging chaos. When the planning group do reach consensus about the most defensible alternative in course design, they move into the design phase which includes decision-making about specific subjects, instructions, teaching materials, and other activities that the planners advise. In the process of course design it is extremely important that participants make their individual beliefs and values explicit as well as their perceptions of the instructional task and their assertions about how to proceed. The importance of the deliberative approach is that it recognizes the variety of beliefs, aims, and images that participants in a project on course design adhere to and that may frustrate a rational and linear design process. Walker’s model also offers guidelines for reaching consensus and for how to proceed when this does not happen.

The importance of deliberation has been stressed by several other authors. Banathy (1987 p. 93) states that “the process of arriving at better decisions is not a process of optimization. It is rather a process of negotiation among those with different points of view and value systems in order to find a satisfying solution.” This calls for a participative design where major stakeholders are involved. Banathy (1987) emphasizes an iterative and spiraling design process where the designer may pass several times through the various phases of the design cycle. Design approaches that combine participative deliberation and iterative procedures advocate prototyping as a vehicle for course design. Gentry (1994 p. 160) defines a prototype as “a functional version of an instructional unit usually in an unfinished state, whose effectiveness and efficiency can be tested.” It offers users an opportunity to find out what they do not like about the proposed unit, which is often easier than exactly indicating what is needed. Prototyping can be regarded as a practical way of organizing deliberation among relevant stakeholders.

### 1.3 An Artistic Approach

Eisner’s ideas on course design are based on philosophical statements that social reality is not objective but subjective, constructed, multiple, and negotiable. Therefore, the decision-making process about curricula resembles very much an artist’s approach to reality. Teacher-curriculum planners portray their views of reality and the students choose how to modify their own views (Eisner 1975). Instead of the monomadic orthodoxy of empirical-analytical approaches, Eisner advocates the artistry of teaching that offers a variety of new assumptions and methods that appreciate the richness of educational practice. He objects to the rigid use of predetermined behavioral objectives and offers strong arguments for the use of

expressive objectives (Eisner 1985) that describe the importance of an "educational encounter." Eisner also advocates an artful process of arriving at consensus about curriculum priorities where various participants become involved in dialogue and discourse. He strongly objects to the traditional selection of academic content and favors that a wide variety of learning opportunities must be provided to students. This requires that teachers become engaged in "educational imagination" to transform the planned curriculum into varied, meaningful, and satisfying learning opportunities for students. Eisner's artistic approach demands that many of the most important decisions about the curriculum be made in the classroom by the teacher who enacts it and who observes how students experience it. It is undeniable that in this artistic view the enacted and experienced curriculum receives greater emphasis than the formally planned curriculum in the more systematic and logic-rational design approaches. However, Eisner offers very few guidelines for the actual planning process. The teacher in the classroom remains the key figure who enacts the curriculum and offers specific learning experiences. In fact, this approach questions the relevance of scientific course design.

Not only in formal education were discussions raised on the limitations of deterministic design strategies. In private enterprises where concepts such as "the learning organization" emerge, much emphasis is put on dialogue (Senge 1990), the use of metaphors, and the process of "imaginization" (Morgan 1993). The aspect of "artistry" in curriculum design can be recognized in the work of Schön (1987), who studied the professional education of architects. The minor importance of the formal curriculum is reflected in the work of Wierdsma and Swieringa (1992). These authors strongly object to a rigid blueprint thinking and encourage a discovery process that enables an organization to find out where they are heading.

#### 1.4 A Cognitive Approach

Posner (1982) introduces the concept of the "curricular task" that forms the core of an approach to curriculum development and course design based on cognitive psychology and a complementary conceptual change model of rationality. An important characteristic in this cognitive approach is that the students' interpretation of the curricular tasks and their subsequent task engagement determine what and how much they learn. This emphasis on cognitive operations instead of on instructional activities is reflected by Posner's greater interest in students' problem-solving processes than in achievement testing. Students shape their tasks or construct problem spaces on the basis of their interpretations of the task environment against the background of past experience, the availability of internal and external resources, the costs and benefits of engagements, and their purpose of being in the situation.

The cognitive approach is based on a thorough understanding of how knowledge is organized to permit storage, retrieval, and utilization of knowledge, and how a person's previous experience and existing knowledge affect perceptions, communication, learning, and performance of tasks (Posner 1978). The book *Course Design: A Guide to Curriculum Development for Teachers* (Posner and Rudnitsky 1986) offers a framework that apparently follows a rational and linear process of goal setting, instructional planning, and evaluation in a manner that many other design approaches in the systematic tradition do. However, considerable attention is given to the technique of conceptual mapping. A conceptual map is a chart depicting the relationships between the important ideas with which the content of a course deals. The map describes the organization of understandings in the course. The techniques of conceptual mapping, the organization of cognitive elements into an instructional focus, and the sequencing of the units of the course reflect the cognitive approach most clearly. In the design process of courses based on conceptual maps, the analysis of curricular tasks and the relationships between their cognitive components play a crucial role. Patrick (1991, 1992) describes many techniques for conducting task analysis that focus on human information processing, metacognitive skills, and inferential reasoning, which support course design in this cognitive approach.

#### 1.5 A Constructivistic Approach

A central idea in constructivism is that students construct knowledge for themselves. From a radical point of view, knowledge construction implies that each person knows the world in a different way, that there is therefore no shared objective knowledge to teach about, and consequently that instructional analysis and prescription make no difference to what students learn (Winn 1993). From an extreme perspective, there is nothing that instructional designers can do to affect students' understanding and behavior if knowledge is entirely constructed by students. If constructivists are right that students do not react in predictable ways to instruction and that what is taught has no factual, conceptual, rule-based, or procedural foundation in the real world, it is pointless to design courses. However, not all constructivists take this radical position.

The main constructivist criticism of course design concerns its reductionistic analysis, the presupposition as if there were an objective reality, the belief in deterministic prescriptions based on the assumption that changes in behavior and knowledge can be predicted, and finally that carefully designed instruction is replicable. Constructivism holds that learning is a process of building up structures of experiences. Learners do not transfer knowledge from the external world into their memories, rather they create interpretations of the world based upon past experiences

and their interactions in the actual world (Cunningham 1992a, 1992b). In the constructivist view a course should provide contexts and assistance that will aid the individual in making sense of the environment as it is encountered (Duffy and Jonassen 1992). The extreme constructivists reject course design methods as these assume an invalid idea about knowledge acquisition. The evident autonomy of learners in knowledge construction makes it difficult if not impossible to predict how they will learn or to plan instructional activities (Winn 1992). However, their alternative is not very well-developed yet. One of the few examples of constructivist design is offered by Spiro et al. (1992) in the form of cognitive flexibility hypertexts, and refers to the design of nonlinear computer learning environments. The basic characteristics are "landscape crisscrossing," requiring rearrangement of instructional sequences, multiple dimensions of knowledge representation, and multiple interconnections across knowledge components. Winn (1993) states that as people communicate with each other all the time, meaning must therefore be shared. Thus, deciding what concepts mean becomes a social activity. Acceptance of the social nature of understanding opens the way for course design. Learning, then, is conceived to be synonymous with acculturation, and is encouraged through practices no different from those found in societies having no formal system of schooling. The educational process may stress the process of making meaning rather than the end of arriving at a particular understanding.

Lowyck and Elen (1993) assert that the transition in the theoretical foundations of course design toward constructivism requires us not only to change the design prescriptions but also to consider and investigate the mental models and cognitive skills of the instructional designer. It seems as if a constructivistic approach to design is a contradiction in terms. Under constructivism, students select and develop their own learning strategies, and often their own goals and objectives. What should there still be designed? The constructivistic approach probably offers help in complex, ill-structured domains of advanced knowledge. The design will focus on providing flexible and varying amounts of guidance to learners who find their own way in constructing their own knowledge. Constructivism should also be regarded as a strong reaction against the presumed predictability of learning outcomes by the use of rigid design procedures as advocated in behaviorist traditions.

## 2. A Curriculum Consistency Approach for Corporate Course Design

In organizations many kinds of educational needs arise. New employees have to socialize in their new environment and acquire the competencies to perform their tasks. Changing technology, restructuring the work environment, and setting strategic goals all

require adaptation which involves learning that has to be organized. Since competition and economic reasons demand effective and efficient procedures for facilitating the desired learning, there is a strong need for planning devices in corporate education. The curriculum consistency approach (Kessels 1993, Kessels and Plomp 1996) offers a synthesis of systematic approaches as advocated by Tyler and his followers, as well as of the deliberative approach as described by Walker. The consistency approach is based on two principal assumptions: a curriculum or course should be internally and externally consistent.

Internal consistency means that the constituent curriculum elements (such as the problem to be solved, the goals, the desired improvement in performance, the competencies and skills needed, the assessment

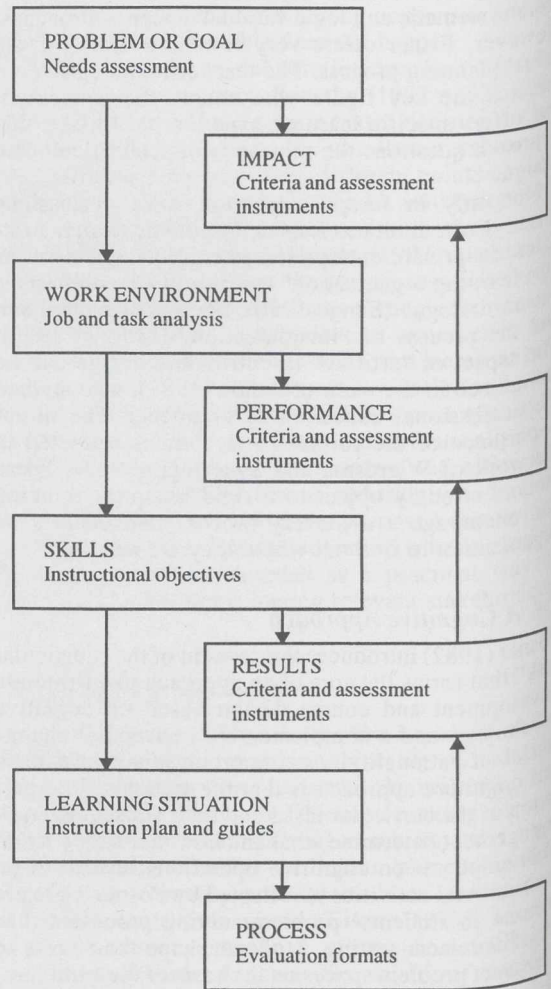


Figure 1  
Internal curriculum consistency

instruments, the required learning environment, and the supporting materials) should be interrelated in a logical and rational way. The concept of internal consistency builds on to the systematic approaches of Tyler (1949), Tracey (1984), Romiszowski (1981), Posner and Rudnitsky (1986), and Rothwell and Kazanas (1992) (see Fig. 1). It offers procedures for the planning of time and resources, systematic problem solving, and cost calculations.

External consistency implies that the stakeholders should share homogeneous notions about what the problem or question to be addressed is and how it will be solved or answered. The stakeholders in corporate settings are top management, local managers and supervisors, designers, trainers, coaches, trainees, and sometimes even clients. The need for external consistency emerges as soon as one acknowledges that learning is not restricted to the classroom and not exclusively controlled by the trainer. The concept of external consistency refers to the assumption that powerful learning processes not only take place in the classroom but also in the day-to-day work environment. Learning occurs the moment employees become engaged in working on their tasks and interacting with colleagues, managers, clients, and artifacts. We could even argue that the learning processes in the work environment should be considered to be more powerful and persistent than those in an artificially created training environment. The concept of external consistency enables an organization to transform into a learning organization (Pedler et al. 1991, Senge 1990). The acknowledgment that the organization offers powerful opportunities to learn is seen as a prerequisite to develop core competencies, which enable an organization to survive in a competitive world (Hamel and Prahalad 1994). The concept of external consistency is closely related to a relational approach in curriculum development and course design. This relational approach refers to the developer's activities in the domain of the interpersonal dynamics of decision-making, gaining commitment, involvement, and support. The relational approach is based on the notion that curriculum development is a social enterprise with all the attending potentialities and obstacles associated with humans engaged in social interaction. The interests, values, ideologies, priorities, role functions, and differentiated responsibilities form the contours of the interactional and dynamic context in which curriculum decisions are made (Gay 1986). The relational approach incorporates major elements of Walker's (1990) deliberative approach. The relational approach contains procedures for project management, critical incidents techniques, dialogues, and decision-making. Elements of the traditional systematic approach like analysis, goal setting, instructional strategy design, and material development can be incorporated in a relational mode.

The consistency approach to course design leaves considerable space for the application of cognitivist

and constructivist perspectives when it comes to creating actual learning environments. In fact, the consistency approach invites decision-makers, designers, trainers, and trainees to become involved in a learning process that enables the construction of new knowledge about how to solve ill-defined problems in an organization. Eventually, the development process of educational provisions may become a more important learning process for an organization than the product of the program design is going to offer. The conjectures underlying the consistency approach and the design standards that support this approach have been empirically tested in a large-scale research project. Thirty-seven private and nonprofit organizations participated in this study, which included 45 curriculum projects in a great variety of subject matter domains. Besides the validation of the design standards, the main conclusion of the study was that educational provisions in organizations become effective when their internally consistent programs are embedded in an externally consistent environment (Kessels 1993, Kessels and Plomp 1996).

These conclusions could also shed new light on implementation problems that occur when introducing new courses in the context of formal education. Therefore, it might be interesting to apply elements of the consistency approach to course design in formal educational settings.

### 3. Conclusion

In the previous sections we portrayed five approaches to course design. Each approach holds a particular perspective that determines the kind of help that is offered to guide a student or trainee in the acquisition of knowledge about the world and the development of competencies to deal with this world. Some authors strongly focus on the products that should support such help. In the systematic approaches the procedures lead toward the efficient production of blueprints for instruction, materials, and control devices. Other authors, in particular in the deliberative and artistic approaches, value the articulation of the beliefs, ideas, images, and priorities that underlie the educational decision-making process.

In the cognitivist tradition the representation of the knowledge acquisition process plays an important role. Therefore, mental mapping and sequencing of instructional focuses are central in the accompanying strategies for course design. In the constructivistic approach, varying from mild to extreme positions, the common point of reference is that there is no objective knowledge that can be transferred to learners. Learners construct their own meaning of the world, and therefore the learning takes place on the basis of past experiences in interaction with the environment. Extreme constructivists reject the idea of course design as a reductionist and predetermined activity that inhibits learning. Mild constructivists accept the idea of course

design as long as it offers learners coaching on request with multiple dimensions of knowledge representation and allows for multiple connections across knowledge components.

The curriculum consistency approach, elaborated for the context of corporate education, combines elements from the systematic design approaches with considerations that are characteristic for the deliberative approach. The basic assumption is that learning in an organization does not exclusively occur in a training situation confined to the classroom. The organization as a whole is considered as a learning environment. Therefore, the major actors in that environment should share coherent ideas about what the question is to be answered and how learning processes will play a role in solving that problem. Educational provisions should be consistent in themselves and embedded in an externally consistent environment. The design process is regarded as a crucial learning strategy for the organization as it offers the participants an opportunity to construct new knowledge about the nature of the problems under study and about to process needed to solve these problems. The curriculum consistency approach is closely related to the emerging concepts of the learning organization and the knowledge economy.

See also: Systems Approach to Design and Development

References

Banathy B H 1987 Instructional systems design. In: Gagné R M (ed.) 1987 *Educational Technology: Foundations*. Lawrence Erlbaum, Hillsdale, New Jersey

Bobbitt F 1918 *The Curriculum*. The Riverside Press, Cambridge, Massachusetts

Branson R K, Grow G 1987 Instructional systems development. In: Gagné R M (ed.) 1987 *Instructional Technology: Foundations*. Lawrence Erlbaum, Hillsdale, NJ

Briggs L J 1977 *Instructional Design: Principles and Applications*. Educational Technology Publications, Englewood Cliffs, New Jersey

Cunningham D J 1992a Assessing constructions and constructing assessments: A dialogue. In: Duffy Th M, Jonassen D H (eds.) 1992

Cunningham D J 1992b In defense of extremism. In: Duffy Th M, Jonassen D H (eds.) 1992

Dick W, Carey L 1990 *The Systematic Design of Instruction*. Scott Foresman, London

Duffy Th M, Jonassen D H (eds.) 1992 *Constructivism and the Technology of Instruction: A Conversation*. Lawrence Erlbaum, Hillsdale, New Jersey

Eisner E W 1975 *The Educational Imagination*. Macmillan, New York

Eisner E W 1985 *The Art of Educational Evaluation. A Personal View*. The Falmer Press, Philadelphia, Pennsylvania

Gay G 1986 Curriculum development. In: Eraut M (ed.) 1986 *The International Encyclopedia of Educational Technology*. Pergamon Press, Oxford

Gentry C G 1994 *Introduction to Instructional Development*. Wadsworth, Belmont, California

Hamel G, Prahalad C K 1994 *Competing for the Future*.

Harvard Business School Press, Boston, Massachusetts

Kessels J W M 1993 Towards design standards for curriculum consistency in corporate education (Doctoral dissertation, Twente University)

Kessels J W M, Plomp T 1996 The importance of relational aspects in the systems approach. In: Dills Ch R, Romiszowski A J (eds.) 1996 *Instructional Development: Paradigms for the Future*. Educational Technology Publications, Englewood Cliffs, New Jersey

Lowyck J, Elen J 1993 Transitions in the theoretical foundation of instructional design. In: Duffy T M, Lowyck J, Jonassen D H (eds.) 1993 *Designing Environments for Constructive Learning*. Springer, Berlin

Morgan G 1993 *Imagization; The Art of Creative Management*. Sage, London

Patrick J 1991 Types of analysis for training. In: Morrison J E (ed.) 1991 *Training for Performance*. Wiley, Chichester

Patrick J 1992 *Training: Research and Practice*. Academic Press, London

Pedler M, Burgoyne J, Boydell T 1991 *The Learning Company. A Strategy for Sustainable Development*. McGraw-Hill, London

Posner G J 1978 Tools for curriculum research and development: Potential contributions from cognitive science. *Curric. Inq.* 8(4): 311-40

Posner G J 1982 A cognitive science conception of curriculum and instruction. *J. Curric. St.* 14(4): 343-51

Posner G J, Rudnitsky A N 1986 *Course Design: A Guide to Curriculum Development for Teachers*. Longman, New York

Romiszowski A J 1981 *Designing Instructional Systems*. Kogan Page, London

Rothwell W J, Kazanas H C 1992 *Mastering the Instructional Design Process. A Systematic Approach*. Jossey-Bass, San Francisco, California

Schön D A 1987 *Educating the Reflective Practitioner*. Jossey-Bass, San Francisco, California

Senge P 1990 *The Fifth Discipline: The Art and Practice of the Learning Organization*. Doubleday Currency, New York

Spiro R J, Feltovich P J, Jacobson M J, Coulson R L 1992 Cognitive flexibility, constructivism, and hypertext: Random access instruction for advanced knowledge acquisition in ill-structured domains. In: Duffy Th M, Jonassen D H (eds.) 1992

Taba H 1962 *Curriculum Development: Theory and Practice*. Harcourt, New York

Tracey W R 1984 *Designing Training and Development Systems*, rev. edn. American Management Association, New York

Tyler R 1949 *Basic Principles of Curriculum and Instruction*. University of Chicago Press, Chicago, Illinois

Tyler R 1966 New dimensions in curriculum development. *Phi Del. Kap.* 48: 25-28

Walker D F 1971 The process of curriculum development: A naturalistic approach. *Sch. Rev.* 80: 51-65

Walker D F 1990 *Fundamentals of Curriculum*. Harcourt Brace Jovanovich, San Diego, California

Wierdsma J, Swieringa A 1992 *Becoming a Learning Organization. Beyond the Learning Curve*. Addison-Wesley, Reading, Massachusetts

Winn W 1992 The assumptions of constructivism and instructional design. In: Duffy Th M, Jonassen D H (eds.) 1992

Winn W 1993 A constructive critique of the assumptions of instructional design. In: Duffy Th M, Lowyck J, Jonassen D H (eds.) 1993 *Designing Environments for Constructive Learning*. Springer, Berlin