

	Specifically Instructional Technology Related	Specifically Performance Technology Related
<b>1900s</b>	<p>E L. Thorndike provided the beginnings of educational testing where learning is stimulus associated with results and does not necessarily mean that thought is involved. Measuring human change is important including reinforcement.</p> <p>Max Wertheimer initiates the Gestalt (organization) Theory where it was believed that learning came more than just an experience using stimulus and responses – it required thought as well.</p>	
<b>1910s</b>	Ivan Pavlov introduced the concept of classical conditioning where a stimulus is conditionally associated with a specific response until the stimulus causes the response all of the time.	
<b>1920s</b>	Wolfgang Kohler introduces the concept that apes were able to learn by applying previous associated learning with new concepts.	
<b>1930s</b>	Ralph Tyler's 8-year study - Tyler used objectives and evaluated if the information being taught had desired results by studying high school students and their achievements in college. He posed that curriculum should be refined and revised until the appropriate behaviors are achieved.	
<b>1940s</b>	WWII personnel training needs allowed media exploration including films, photos, audio recordings, and even silent films and implementation.	Edgar Dale defined his Cone of Experience to be used as rationale for the use of media within instruction. He identifies reading, hearing, viewing, watching, participating, and experiencing simulations are methods of learning.

**Specifically Instructional  
Technology Related**

**Specifically Performance  
Technology Related**

**1950s**

B. F. Skinner's work started the programmed instruction movement where learners were taught information in a controlled environment.

Benjamin Bloom, et al, developed the Taxonomy of Educational Objectives. Defines that specification and analysis of instructional outcomes should occur and to design instruction to attain them.

Jean Piaget studies and offers child behavior and learning styles. This was an explanation of the development of thinking from infancy to adulthood.

Abraham Maslow defines his Hierarchy of Needs that should be used when defining the motivation and values students place on learning.

**1960s**

Robert Glaser uses Instructional System and defines criterion-referenced test. His Instructional System is based on descriptive models of learning theory and prescriptive theories of instruction.

Donald Ely defined the used of learning theory as an element of instructional technology.

Jerome Bruner poses discovery learning and problem solving in his Process of Education and Theory of Instruction. He postulates that knowledge is represented in 3 ways: enactive, iconic, and symbolic.

Vannevar Bush wrote an article defining his vision of the soon to be Internet.

Donald Kirkpatrick developed training evaluation where there are four levels – reaction, learning, behavior, and results – that should be considered in reverse when defining the reactions or results we desire, then the behavior that is needed to accomplish them. Identifies four levels of evaluation including learner satisfaction, learner achievement, transfer of knowledge on the job, and the impact on the organization.

Robert Gagne worked to develop instructional theories and system design models that had a focus on testing methods to determine performance with his Taxonomy of Learning Outcomes (verbal information, intellectual skills, cognitive strategies, attitudes, motor skills) and 9 Events of Instruction (gaining attention, informing learners of objectives, stimulating recall of prior learning, presenting content, providing learning guidance, eliciting performance, providing feedback, assessing performance, and enhancing retention and transfer to other situations.

Michael Scriven coined formative evaluation where in a cyclical

**Specifically Instructional  
Technology Related**

**Specifically Performance  
Technology Related**

**1970s**

process, curriculum is reviewed and revised repeatedly to ensure the appropriate behaviors are achieved.

Ted Nelson coined the word hypertext and designed a computer-based non-sequential writing method.

Douglas Engelbart invented the computer mouse and the On-Line System (NLS) that he believed would assist with human performance. Engelbart worked at Stanford Research that was one of the locations connected by the ARPANET, one of the first forms of the Internet.

Thomas Gilbert published the book 'Human Competence' in 1978, where he described worthy performance as his First Leisurely Theory, the potential for improving performance in his Second Leisurely Theory, and his six components necessary to cause a behavior as his Third Leisurely Theory. His theories, for example, allow for a conversion of human potential into human capital. Using his Behavior Engineering Model, managers can find the reasons behind performance problems and reminds them of the Diffusion Effect where one action can cause alternate reactions, which may be desired or undesired.

Roger Kaufman and his colleagues identified an Organizational Elements Model that identifies five elements of a system (inputs or raw materials, processes, individual products or accomplishments, organizational outputs or accomplishments, and outcomes or the effects in and for society) and the interrelationship

**Specifically Instructional  
Technology Related**

**Specifically Performance  
Technology Related**

**1980s**

John M Keller defined the ARCS Model exploring the motivation of a learner and his spiral curriculum. ARCS is used to improve the motivational appeal of instruction.

between them. This systems approach includes analysis, synthesis and implementation within a needs assessment to ensure that training is the correct intervention.

Marc J. Rosenberg defined human performance technology focusing on the analysis of performance problems or potential and the possible causes of them. In addition, he defined a PT model where performance analysis is done, then a cause analysis, and then the selection of the intervention.

Robert Mager looks to systems as an approach to performance with the definition of behavioral and performance objectives using performance, conditions, and criterion. In this way we can define where we are going, how we will get there, and how we will know when we arrive.

Joe Harless describes performance analysis as front-end analysis (FEA) where the process of analysis, design, development and testing implementation and evaluation of relevant and cost-effective training interventions.

Allison Rossett uses Training Needs Assessment to discover optimal, actual, feelings causes, and solutions. In determining these assessments, instructors should use determining purposes based on initiators, identify sources, select the appropriate tools, conduct needs assessments, and use the results for decision-making.

Walter Dick and Lou Carey defined systems oriented instruction (instructional design model)

**Specifically Instructional  
Technology Related**

**Specifically Performance  
Technology Related**

where the first step was to assess the needs to identify the goals or product outcomes. Design planning includes instructional analysis, writing performance objectives, develop assessments, develop strategies to implement, select materials, define formative evaluations and summary evaluations.

**1990s**

These are not included in the table, as they are not truly related to IT or IP, but to psychology or organizational behavior.

Frederick Taylor - Principles of Scientific Management

Elton Mayo - Hawthorne studies

Douglas McGregor - Theory X and Y

David McClelland - Three Needs

Frederick Herzberg - Two-factor Theory