

**Significant Events Influencing the Field of  
Instructional Systems Design (ISD): Concept Maps & Elaboration**

Joel Galbraith

(Timeline in collaboration with Khusro Kidwai)

Our Current ISD Definitions:

*“Research and methods to improve the effectiveness, efficiency and the appeal of instruction materials and learning experiences.”*

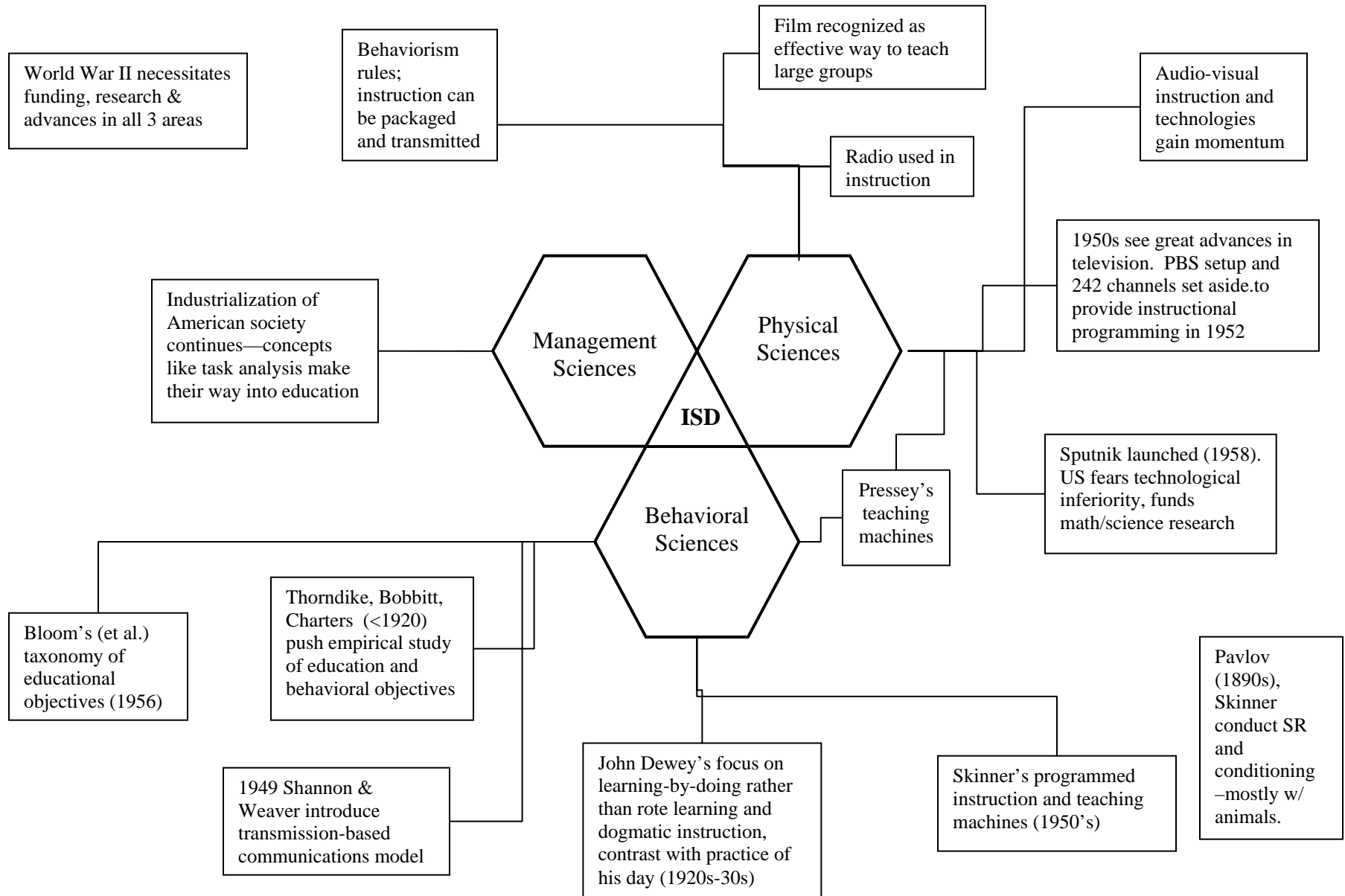
-Joel Galbraith

*“Research and Design of learning environments to facilitate different kinds of cognitive performances.”*

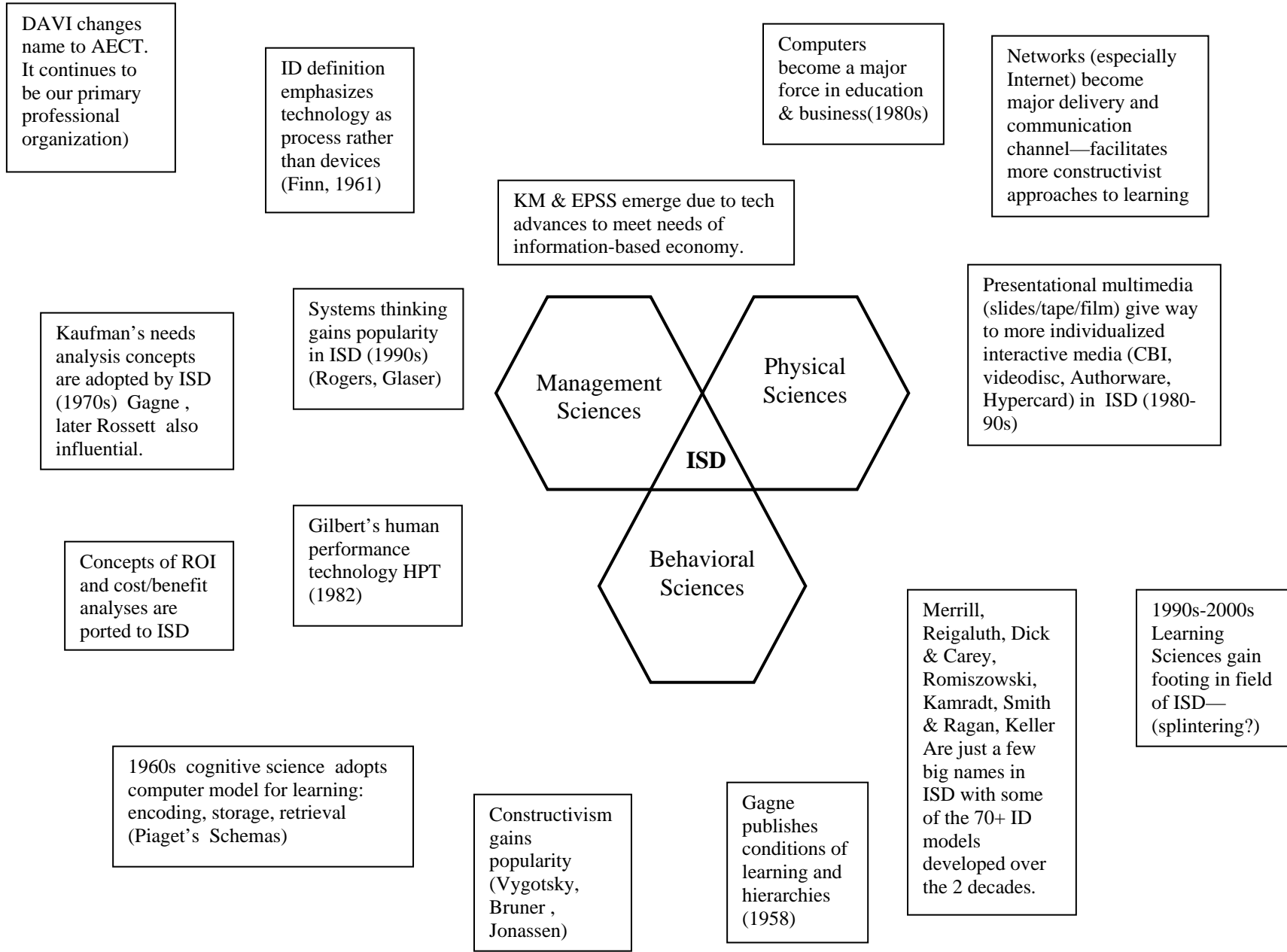
-Khusro Kidwai

**Note:** Materials are color-coded. Document best viewed in **COLOR**.

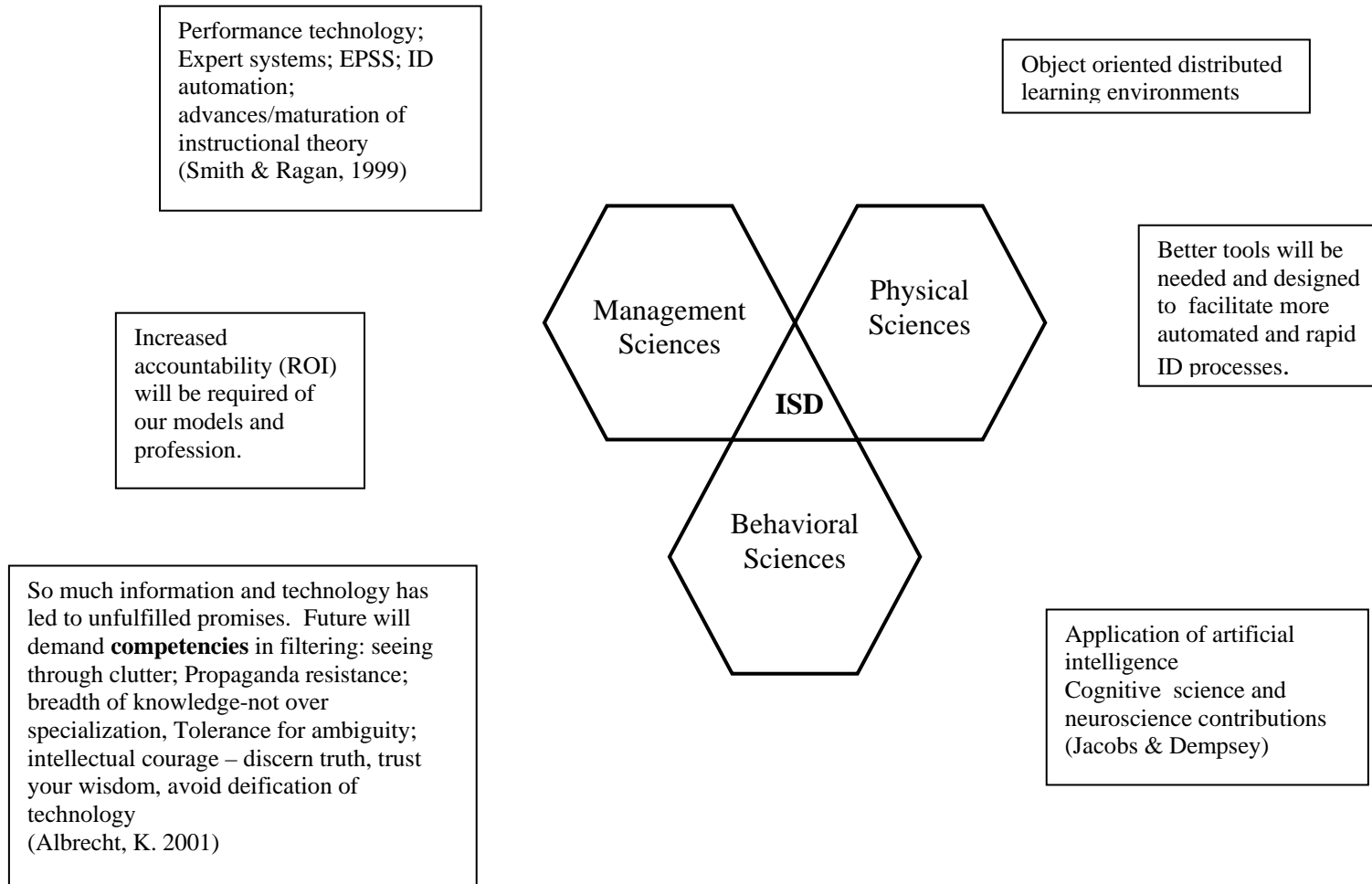
## Past (1900-1960)



## Present (1960-2004)



## Future (2005-2025)



Timeline	Description
Legend	History; Definition; Theory (Learning and Management theory); Technology
Pre-1920's	<p>(1905) - First school museum opened in St. Louis. Visual instruction's importance was realized by educators. Precursor to the contemporary media center.</p> <p>(1910) - The first catalog of instructional films was published. The public school system in Rochester, NY was the first to implement the usage of films for instruction.</p> <p>(1913) - Thomas Edison proclaimed "Books will soon be obsolete in schools...It is possible to teach every branch of human knowledge with the motion picture."</p> <p>Edward Lee Thorndike (1913), considered the father of modern educational psychology:</p> <ol style="list-style-type: none"> <li>1. Moved from a strict concern with discovering the laws of learning to an interest in and advocacy of social engineering, the idea that instruction should pursue pre-specified, socially useful goals</li> <li>2. Advocate of educational measurement...a field in itself that became very important in establishing education as a science.</li> <li>3. Talks about when a connection between stimuli and response is made, and accompanied/ followed by a satisfying state, the connection's strength is increased.</li> </ol>
1920's	<p>Individualized instruction: self-paced, self instructional, self-corrective workbooks. Note this is not self-planned. Diagnostic placement tests and self-administered tests that students could use to determine if they were ready for testing by the teacher.</p> <p>Utilitarian or social efficacy movement advocated by Franklin Bobbitt. Bobbitt believed that schools should provide experiences specifically related to those activities demanded of citizens by their society. Furthermore, he thought that the goals for schooling could be derived from an objective analysis of those skills necessary for successful living.</p> <p>Charters and Bobbitt were also advocates for empirical methods creating a more in depth interest and evaluation of educational problems.</p>
1923	<p>The visual instruction movement grows and 5 national professional organizations for visual instruction were established.</p> <p>What is now called the Association for Educational Communications and Technology, National Professional Organization for Visual Instruction, was established.</p>

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1930's	<p>John Dewey's focused on learning-by-doing rather than rote learning and dogmatic instruction, the current practice of his day. His progressive movement advocated student-initiated activities. This resulted in an educational climate inhospitable to pre-specified instructional outcomes.</p> <p>Tyler's eight year study, designed in response of the post war pressures to revise the prevailing college preparatory high school curriculum in order to meet the needs of increasing number of students who in earlier years would not have gone beyond the elementary school.</p> <p>Tyler pushes for behavioral objectives and formative evaluation.</p>
1932	<p>The merger of 3 existing national professional organizations for visual instruction into the DVI (which would eventually evolve into the AECT).</p> <p>The field focus moves from audio or visual instruction to audiovisual instruction.</p>
1940's	<p>WWII created an enormous instructional problem: thousands of military personnel had to be trained rapidly to perform thousands of tasks critical to their own survival and the war effort. Since the audiovisual devices used during WWII were perceived as successful in helping the U.S. solve a major training problem, schools developed a renewed interest in using audiovisual devices. These audiovisual aids are the forerunners of the self-improvement and entertainment videos today; tutorial, games and virtual reality devices.</p> <p>Instructional technologist, as a profession came into being.</p>
1946	<p>Edgar Dale developed the 'Cone of Experience'. The purpose of the cone was to provide a visual example of 10 divisions of audiovisual materials in the learning process from direct experience to pure abstraction.</p> <p>The introduction of television in the home made it possible to eventually offer educational instruction in the form of shows like Sesame Street for children too young to attend formal school.</p>
1949	<p>Shannon and Weaver's model of communication focused on the process of communication, involving the sender and receiver of a message and the channels of communication used.</p>
1950's	<p>Skinner published article on programmed instruction in 1954. Clearly stated behavioral objectives, small frames of instruction, self-pacing, active learner response to inserted questions, and immediate feedback regarding the correctiveness of the response.</p>

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	<p>1. "How results of certain scientific research can be brought to bear upon practical problems in education." (Science of Learning and the Art of Teaching, Skinner)</p> <p>2. "There are more people in the world than even before, and a far greater part of them want an education." (Teaching Machines, Skinner)</p> <p>Task analysis Flanagan (1954) and Miller (1962)</p>
1952	Government showed support for technology's use in instruction. Decision by the FCC to set aside 242 TV channels for educational purposes. The concept of using the TV as an instructional medium, and congress setting aside channels for that purpose. (Significant meeting takes place at Nittany Lion Inn-PSU)
1952	Carpenter (Penn State) introduces a theoretical orientation for instructional film research. He recommends 8 general hypotheses that should guide research in the field.
1956	Benjamin Bloom and his colleagues published the Taxonomy of Educational Objectives. The authors indicated that within the cognitive domain there were various types of learning outcomes; that objectives could be classified according to the type of learner behavior described therein, and that there was a hierarchical relationship among the various types of outcomes.
1956	Miller publishes paper on short term memory (STM) able to store 7 units +/-2. Chunking allows for larger units to be processed as single unit.
1958	Sputnik launched. Media research was funded extensively as a result of government trying to improve standards in math and science.
1960's	<p>A definition of the field was attempted that began to promote the message rather than the devices employed. (i.e. technology as processes/procedures, not machines/hardware). In 1961, James Finn established a Commission on Definition and Terminology whose goal was to define the field and associated terminology. Leaders of the field realized the field was much broader and a new view of the field was emerging. Broad adoption of the system's approach to the field as well as an attempt to redefine and structure the goals of the field to reflect the increased importance of theory and not just technology. Public Television is founded. Sesame Street is founded</p> <p>Gagne:</p> <p>1. Clearly described the breach between psychological research on learning and</p>

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	<p>educational practice and the need for professionals actively engaged in developing the science of instructional technology.</p> <p>2. Conditions of learning: Analysis of learning objectives as they are related to different instructional designs.</p> <p>3. Norm-referenced --&gt; criterion-referenced measures (mastery learning)</p> <p>4. Learning Hierarchies: Intellectual capabilities having an ordered relationship to each other. predicting optimal sequences of learning events.</p> <p>AV people started embracing the larger concept of instructional development and technology. DAVI was formed.</p>
1962	Roger Mager published his book on behavioral objectives
1962	<p>Robert Gagne introduced the idea of task analysis to instructional design. (Because of his task analysis theory instructional design could be broken down into events which helped shape this domain.) Building on the principles of the systems approach which Skinner explored in programmed instruction, Gagne further defined task analysis as the hierarchical relationship of tasks and subtasks.</p> <p>Robert Glaser coined the term “instructional system” and was concerned with the breach between the psychology and science of learning.</p>
1963	<p>DAVI Commission on Definition and Technology defined the “first” definition of the field (Ely).</p> <p>The Ford Foundation decided to focus its support on public television in general, rather than on in-school applications of instructional television.</p>
1968	"Relationship of behavioral science to instructional technology, parallels that of physical sciences to engineering technology, or the biological sciences to medical technology" (Saettler)
1970's	<p>Name change to current name AECT. This name change reflected the shift in technology away from audiovisual tools to other methods of innovation for instruction purposes. This event is important because it reflects the realization and willingness to explore other potential technologies without limiting themselves to one particular innovation.</p> <p>ID models begin to proliferate well into the 80s—Programmed instruction loses some popularity.</p>



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	<p>Needs assessment (Kaufmann) was added to some models.</p> <p>Potential of cognitive psychology for the refinement of instructional design was noted. (Gagne, 1980): "It can surely be said that the acceptance of cognitive processing as an idea that must be dealt with in theorizing about human learning is a welcome change.... In developing programs of instruction, one must solve the problems of lesson design and media selection by reference to mental states and mental processes, rather than simply in terms of behavioral outcomes."</p>
1970	<p>"Manipulate the environment of individuals in the hope of generating a change in behavior or other learning outcome." (Knezevich &amp; Eye)</p>
1972	<p>"Educational technology is a field involved in the facilitation of human learning through the systematic identification, development, organization, and utilization of a full range of learning resources, and through the management of these processes. It includes, but is not limited to, the development of instructional systems, the identification of existing resources, the delivery of resources to learners, and the management of the processes and the people who perform them." (AECT)</p> <p>Three characteristics are identified: broad range of resources to learning, individualized and personalized instruction, and the use of systems approach.</p>
1972	<p>"Instructional technology is process by means of which we apply the research findings of the behavioral sciences to the problems of instruction." (Engler)</p>
1976	<p>"Educational technology is concerned with the overall methodology and the set of techniques employed in the application of instructional principles." (Cleary et al.).</p>
1977	<p>"Educational technology is a complex, integrate process involving people, procedures, ideas, devices, and organization, for analyzing problems and devising, implementing, evaluating, and managing solutions to those problems, involved in all aspects of human learning." (AECT)</p> <p>Systems approach: "A self-correcting, logical process for the planning, development, and implementation of instruction. it provides a procedural framework within which the purpose of the system is first specified and then analyzed in order to find the best way to achieve it. on the basis of this analysis, the components that are most suitable to the successful performance of the system can be selected...Finally, continuous evaluation of the system...provides a basis for planned change in improving economy and performance."</p>
1977	<p>The Definition and Terminology Committee of the AECT created a very thorough and broad definition outlining the background and purpose of instructional</p>

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	technology. This was a key factor of this field because it created a modern foundation for instructional technology and its effects on the learning process.						
1978	Dwyer publishes “strategies for improving visual learning” addressing the appropriateness of various levels of visual realism in achieving learning of different kinds of knowledge.						
1980's	<p>Systems movement flourished; use of personal computers in education increases. Computers were being used for instruction in more than 40% of elementary schools; 75% in high schools. Nearly exponential growth in microcomputers and technology and the rapid attempt to "synthesize" over 80 years of knowledge to work within this new "computer age." Certain dreams of many pioneers in the field are beginning to be realized with the advent of the computer. The computer's impact as an interactive tool seems to indicate that it may be more widely accepted and developed for IT purposes. Some other mediums in the past seem to have lost their momentum. With the computer becoming such an elemental part of society, there is a lot of promise that the obstacles of the past will not occur again.</p> <p>Adoption of instructional systems development by corporate America.</p> <table border="1" data-bbox="358 1052 1279 1171"> <tr> <td data-bbox="358 1052 813 1094">1995</td> <td data-bbox="816 1052 1279 1094">1998</td> </tr> <tr> <td data-bbox="358 1098 813 1140">one computer for every 9 students</td> <td data-bbox="816 1098 1279 1140">one computer for every 6 students</td> </tr> <tr> <td data-bbox="358 1144 813 1171">50% schools have internet</td> <td data-bbox="816 1144 1279 1171">90% schools have internet</td> </tr> </table> <p>Business: 14% of all formal training is delivered via computers - 1999</p> <p>Performance technology came into being. (Probe Model, Thomas Gilbert, 1982; Ronald Jacobs, 1988)</p>	1995	1998	one computer for every 9 students	one computer for every 6 students	50% schools have internet	90% schools have internet
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1989	Tim Berners-Lee first proposed the World Wide Web, an Internet-based communications network.						
1990s	<p>Constructivist (Bruner, Vygotsky) approaches to ISD advocated by David Jonassen</p> <p>Performance technology; non instructional means such as incentive systems or changes in work environments to solve performance problems. Thus the types of activities many instructional designers engaged in greatly expanded.</p> <p>EPSS: Electronic performance support systems are computer-based systems designed to provide workers with the help they need to perform certain job tasks, at the time they need that and in a form that will be most helpful.</p> <p>Rapid prototyping becomes a popular ID model</p>						

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	<p>Internet becomes dominant distance education medium</p> <p>Knowledge management: Involves identifying, documenting, and disseminating explicit and tacit knowledge within an organization in order to improve the performance of the organization.</p>
1994	<p>“Instructional Technology is the theory and practice of design, development, utilization, management, and evolution of processes and resources for learning.” (AECT Seeles &amp; Richey)</p>
2000's	<p>“The field on of instructional design and technology encompasses the analysis of learning and performance problems, and the design, development, implementation, valuation and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings, particularly educational institutions and the workplace. Professionals in the field of instructional design and technology often use systematic instructional design procedures and employ a variety of instructional media to accomplish their goals. Moreover, in recent years, they have paid increasing attention to non-instructional solutions to some performance problems. Research and theory to each of the aforementioned areas is also an important part of the field.” (Reiser, 2002)</p>
Future	<ol style="list-style-type: none"> <li>1. Object oriented distributed learning environments</li> <li>2. Application of artificial intelligence</li> <li>3. Cognitive science and neuroscience contributions (Jacobs &amp; Dempsey)</li> </ol> <p>So much information and technology has led to unfulfilled promises. Future will demand competencies in filtering: seeing through clutter; Propaganda resistance; breadth of knowledge-not over specialization, Tolerance for ambiguity; intellectual courage – discern truth, trust your wisdom, avoid deification of technology (Albrecht, K. 2001)</p> <p>Performance technology; Expert systems; EPSS; ID automation; advances/maturation of instructional theory (Smith &amp; Ragan, 1999)</p>