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Instructional Technology

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Instructional technology is used as a broad term and includes the theory and practice regarding the design, development, application, management, and evaluation of the processes and resources that promote learning. This definition, endorsed by the Association for Educational Communications and Technology, is a concise statement about the field and one that may be surprising to those not involved in instructional design processes. It is not unusual for those who are responsible for the delivery of instruction to think of instructional technology in technical terms—computers, networks, software, and the like. As can be seen from the definition, instructional technology involves the *systematic* application of processes to solve instructional problems. Currently, professionals in the field use the term interchangeably with *educational technology*, although a strong argument has been made by some leading professionals that instructional technology is a subset of educational technology focusing on learning that is purposive and managed.

The literature of the field is replete with other terms, such as *instructional development*, *instructional design*, *instructional systems design*, and even *instructional media*, that are often used interchangeably with instructional technology. The definition and the resulting confusion of terms evolved throughout the 1900s as education, instruction, and technology changed. A brief look at the history of instructional technology may help to clarify this issue.

History of Instructional Technology

The history of instructional technology is necessarily the history of instruction and technology. This history shows the merging of the two fields into one field focused on improving instruction.

Prior to World War II

During these early years, the explication of new theoretical concepts moved instruction away from the exercise metaphor (the brain is similar to a muscle and grows stronger through exercise) toward a scientific description of the ways that humans learn. In

addition, technology began to shape the instructional vision when Thomas Edison stated in 1913 that motion pictures would change the U.S. school system completely within the next 10 years. Edward Thorndike's attempts to establish a knowledge base for human learning and his advocacy of educational measurement enabled fundamental changes in thinking that permitted the development of instructional technology. Early attempts to improve instruction, such as the Winnetka and Dalton Plans, provided the impetus for the development of the concepts of objectives, individualized instruction, and mastery learning. In the 1930s, Ralph Winifred Tyler and others developed the concepts of *behavioral objectives* and *formative evaluation*, although the latter term would not be coined for some 35 years.

World War II and the 1940s

The challenge of training millions of servicemen and servicewomen and the necessity to train others to support the war effort at home led to the development of audiovisual communications techniques specifically targeted at the instruction of masses of students. The infusion of government funds enabled psychologists and educators to conduct experimental research in learning methods. After the war, such research continued.

The 1950s

This decade can be characterized by theoretical developments that enabled the birth of instructional technology as it is practiced today. It saw the popularization of programmed instruction, derived in large part from B. F. Skinner's operant conditioning. Task analysis, a technique that permitted a task to be described by looking at the subtasks from which it was composed, was begun. Benjamin Bloom published his *Taxonomy of Educational Objectives for the Cognitive Domain*. These three concepts led to the development and popularization of the instructional design models of the 1960s and later.

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The 1960s and 1970s

The early 1960s saw the development of the *systems approach* to instruction, a term first employed in 1962. Robert Gagne followed in 1965 with his landmark work, *The Conditions of Learning*, which focused on the five domains of learning outcomes and the events of instruction that enable the achievement of those outcomes. Gagne also did foundational work in learning hierarchies, the concept that complex skills or knowledge are built from simpler skills and knowledge. As a direct result of the millions poured into math and science instruction due to the Sputnik shock, the important concept of evaluation being integral to instruction was developed. During the 1970s, models of instructional design matured, interest in its study flourished, and the computer was developed and began to be used in instruction.

1980s and 1990s

These two decades saw the refinement of previous theories and models. The advent and rapid development of the microcomputer and later the Internet dominated instruction. Perspective began to shift from teacher as expert to teacher as facilitator, a constructivist idea, bringing back the theoretical perspectives of John Dewey.

Emerging Issues

At the beginning of the twenty-first century, we still see the rapid change in the technology and in the performance of technology. Computers and other knowledge management devices manipulate and store more data faster. Communication of data, voice, and video is almost anytime, anywhere. This enables instructional technologists to use better tools to help students learn. Performance technology, electronic performance support, and knowledge management are but a few of the emerging concepts that will influence instructional technology now and in the future. Instructional technologists are developing models, including rapid prototyping models, to support Web-based instruction and performance support systems. Future definitions of

instructional technology will probably include the analysis of performance problems and the application of these concepts to noninstructional processes in a variety of settings.

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See also

- [accountability](#)
- [behavior, student](#)
- [computers, use and impact of](#)
- [Dewey, John](#)
- [differentiation of stimuli](#)
- [feedback](#)
- [instrumentation](#)
- [motivation, theories of](#)
- [Skinner, B. F.](#)
- [technology and the law](#)
- [television, impact on students](#)
- [Thorndike, Edward](#)
- [Tyler, Ralph Winifred](#)

Further Readings and References

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