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A Brief History of Instructional Development

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Before one sets out to write or read a history of instructional development (ID), it seems there are a few points that should be made to put the endeavor into perspective. First, the history of instructional development is unlike the history of the steam engine or the history of the computer. The reason is the absence of unanimity or even of consensus regarding the definition of instructional development. Some use the terms *instructional development* and *instructional technology* interchangeably. Others use the terms *instructional development* and *instructional design* interchangeably.

The second point is that even if one does distinguish between these terms, it would be hard to argue that the concepts to which they refer are irrelevant to a history of instructional development. In other words, rather than a linear progression of well-documented events, the history of instructional development is the story of a gradual confluence of ideas, which took place over several decades. Many of the composite ideas have been legitimately attributed to several different sources, and many of these ideas have and still do overlap with other concepts and procedures that are not instructional development.

This chapter focuses on the history of instructional development, rather than of instructional media or instructional design. However, given the ambiguity of the concept and the divergent nature of its roots, this chapter necessarily reflects judgments based on my experiences in the field. This is to say that there exist other ways to describe the history of ID that would be no less correct. The chapter begins with a definition of instructional development. The remaining sections are defined by decades, beginning with the years before the 1920s. Because this is largely a history of ideas rather than of events, the separation into decades will at some times seem arbitrary. Ideas are difficult to date with precision; they arise from previous ideas and carry over into ensuing decades. It is hoped that the use of decades as divisions will provide a cognitive scaffolding onto which the reader may attach the major points of progression in the evolution of instructional development.

INSTRUCTIONAL DEVELOPMENT: A DEFINITION

So of what is this chapter a history? A workable definition of instructional development for this chapter might be a self-correcting, systems approach that seeks to apply scientifically derived principles to the planning, design, creation, implementation, and evaluation of effective and efficient instruction. This definition is appropriate for the purposes of this chapter because it is a general one that does not include specific steps in the ID process. The way the steps are portrayed differs from model to model (Andrews & Goodson, 1980), and this is not a history of any particular ID model. Notice that the definition implies instructional design, but makes no explicit reference to instructional media; nevertheless, media professionals have played an important role in the history of instructional development, and the following sections include frequent references to the media field.

BEFORE THE 1920s: BIRTH OF AN EMPIRICAL KNOWLEDGE BASE FOR EDUCATION

One of the fundamental ideas supporting instructional development is the idea of instructional design, that is, the notion that empirically based principles can be applied to generate predictably effective instruction. While it may be difficult to imagine now, in the not too distant past instruction was dominated by the exercise metaphor: the mind was thought to consist of faculties in need of exercise. The study of certain disciplines was thought to improve mental performance in the way that calisthenics improve muscle functioning. Schooling was conducted in accordance with such traditional practices unencumbered by a systematic examination of outcomes. A major ideological breakthrough occurred with the advent of scientific investigation into human and animal learning.

While many contributions could be listed here as important in shifting the prevailing concept of instruction, the work of E. L. Thorndike at Columbia University was perhaps most influential (Baker, 1973; Saettler, 1968) and particularly salient for the field of instructional development. While the details of Thorndike's theories may not appear to be influential in instructional design today, the so called "big picture" of what he was trying to do presaged many of the tenets of ID. Beyond his importance as an early figure in the effort to establish a knowledge base for human learning, two points in particular are noteworthy. First, during his long career Thorndike 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 prespecified, socially useful goals. Second, Thorndike was a strong advocate of educational measurement, a research tool and then a field in itself that became very important in establishing education as a science (Snelbecker, 1974). It is not difficult to see in these ideas the fundamental shift in thinking about education that would ultimately make possible the development of ID.

THE 1920s: OBJECTIVES

The third decade of the century saw the maturation of several ideas that are fundamental to instructional development. Most prominent among these are educational objectives and individualized instruction. Also in this decade appeared the seeds of ideas that would be fully elaborated only decades later.

According to Baker (1973), the waning of the "mind as a muscle" metaphor accelerated the acceptance of the utilitarian or social efficiency movement advocated by Franklin Bobbitt. Bobbitt (1918) 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. It is not difficult to see here the roots of job and task analysis: the notion of analyzing a complex skill into its component subskills. Even more clearly discernible was endorsement of the connection between outcomes and instruction: specifying desirable outcomes and then planning instructional experiences that would facilitate their acquisition.

Others translated the ideas posited by Bobbitt, Thorndike, and others into actual curricula and instruction that sought to apply the tenets of objectives-driven learning. These were the famous individualized instruction "plans" begun in the late teens but realized and popularized in the 1920s. The first of such plans appears to have been that of Mary Ward and Frederic Burk at the San Francisco State Normal School. The distinctive feature of this plan was its reliance on self-instructional materials that allowed learners to progress at their own pace with a minimum of teacher direction. The endeavor was abruptly curtailed by a California court ruling that only the State Board of Education could publish printed instructional materials (Saettler, 1968). However, two of Burk's associates, Carleton W. Washburne and Helen Parkhurst, went on to develop more elaborate and better known individualized instructional plans.

Washburne created the Winnetka Plan while superintendent of the Winnetka, Illinois, public schools. This plan not only made use of self-paced, self-instructional, self-corrective workbooks, but also incorporated diagnostic placement tests and self-administered tests that students could use to determine if they were ready for testing by the teacher. Only after performing satisfactorily on the teacher administered test could the student undertake new tasks (Saettler, 1968).

The Dalton Plan was originally developed by Parkhurst for use in an ungraded school for crippled children. It was subsequently implemented in Dalton, Massachusetts, and New York City (Saettler, 1968; Tyler, 1975). The plan centered on what we would call today "contract learning." After having agreed to contracts, students were free to complete them at their own pace. However, no new contracts were permitted until the current one was satisfactorily completed.

The Winnetka and Dalton plans thus embodied not only prespecified learning outcomes and self-pacing within school subjects, but mastery learning as well. Of these the concept of prespecified objectives was perhaps the most seminal; the others can be seen as logical consequences of this one remarkable idea. The concept of mastery learning is made possible by goal specification and assessment. Once intended outcomes are made clear and their assessment is sought, the need for self-pacing and other forms of individualization becomes apparent as individual differences in goal attainment are revealed. It is not surprising that instructional development, with its grounding in objectives, has always been firmly linked with advocacy of individualized instruction and mastery learning (Reiser, 1987).

Besides providing impetus to the concepts of objectives, individualized instruction, and mastery learning, these plans provided evidence that there was an alternative to the normal curve of student achievement resulting from traditional instruction. Because they involved so much self- as opposed to teacher-led instruction, the experience of these plans made clear the need for carefully designed materials. Thus the individualized learning plans of the 1920s provided a rationale for continued development of designed as opposed to traditional instruction.

THE 1930s: BEHAVIORAL OBJECTIVES AND FORMATIVE EVALUATION

Progress toward the creation of instructional systems slowed during the 1930s (Baker, 1973; Reiser, 1987). Two reasons typically are identified: the Great Depression and the ascendency of the Progressive Movement in education. The economic depression decreased funds for research and educational experimentation. Progressivists advocated student-initiated activities; taken to excess, this stance resulted in an educational climate inhospitable to prespecified instructional outcomes.

However, it was during the 1930s that Ralph W. Tyler began the work that was to make him famous, work that in retrospect advanced the evolution of instructional development. In 1933 the Eight Year Study was launched from The Ohio State University, where Tyler was a member of the Bureau of Educational Research. According to Guba and Lincoln (1989), the study had been designed in response to postwar pressures to revise the prevailing college preparatory high school curriculum in order to meet the needs of increasing numbers of students who in earlier years would not have gone beyond elementary school. The Eight Year Study sought to determine if students completing alternative high school curricula could succeed in college; an eight-year longitudinal study was required for the students to complete both the high school and the college degree programs. Thirty public and private secondary schools developed alternative curricula as a part of the research. Tyler was recruited to work on the study because he recently had been working with Ohio State faculty to develop tests of intended learning outcomes, which he termed *objectives* (Guba & Lincoln, 1989).

The Eight Year Study is notable as part of the history of instructional development for two reasons. The first is that the study served to refine the procedures for writing instructional objectives. The study confirmed that objectives could be clarified if written in terms of student behaviors, hence the still current term, *behavioral objectives* (Reiser, 1987). Second, it was essential during the Eight Year Study to ensure that the alternative curricula were implemented as planned. Therefore, the objectives and their assessment were used to revise and refine the new curricula until they produced "an appropriate level of achievement" (Guba & Lincoln, 1989, p. 28). Though the term would not be coined for almost thirty-five years, instructional developers recognize this process as *formative evaluation*. It is clear that Tyler well understood the cyclical nature of evaluation within the process of creating instruction designed to produce specific outcomes (Cambre, 1981). Thus in a frequently overlooked decade two definitive aspects of ID became visible.

THE 1940s: INSTRUCTIONAL MEDIA AND RESEARCH AND DEVELOPMENT

World War II 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. The response to this instructional problem had a far-reaching impact on the evolution of instructional development (Olsen & Bass, 1982; Saettler, 1968).

Part of the government's response to this urgent need was the creation and distribution of thousands of training films and other mediated learning materials. According to Saettler (1968), the Division of Visual Aids for War Training within the U.S. Office of Education alone produced 457 sound motion pictures, 432 silent filmstrips, and 457 instructors' manuals between January 1941, when the division was created, and June 1945. Other agencies within the armed services produced materials as well; 16mm projectors and filmstrip projectors were purchased and distributed by the thousands during these years. Still photographs, audio recordings, transparencies, and slides were used for instructional purposes; mediated strategies were even used to create instructional simulations.

While Saettler (1968) states that "instructional technology came of age during World War II" (p. 179), others might reasonably suggest that it was instructional media rather than instructional technology that was nurtured by the war effort. However, this rapid deployment of mediated instruction undoubtedly influenced the evolution of instructional development in several ways. First, the priority and funding accorded to instruction at this time were conducive to experimentation and innovation. Many of the persons hired by the military to work on the wartime training were well-established researchers (Baker, 1973; Reiser, 1987) and the military training became an example of what a well-funded research and development (R&D) effort directed toward education could accomplish. Furthermore, this R&D effort continued after the war, ultimately predisposing the military toward innovative instructional systems concepts.

Looking more closely, another important development can be discerned that was largely the result of the heavy employment of mediated instruction: the emergence of the role of the instructional technologist. During the process of creating military training films, this role emerged as distinct from that of the subject matter expert (SME) and the technical expert in film making (Saettler, 1968). The need for a professional who could contribute expertise in education to the knowledge of the subject matter expert and the technical expertise of producers was clear to the military staffs responsible for creating effective mediated instruction. The basic instructional development team—designer, SME, and producer—had been conceived, and calls for professionals with formal preparation in this new designer role were forthcoming. Hence, the experience provided important impetus for the growth of a new field.

THE 1950s: PROGRAMMED INSTRUCTION AND TASK ANALYSIS

During the 1950s several ideas that had surfaced earlier were refined and popularized. First among these in historical significance for instructional development was probably programmed instruction; in addition, the analytical processes important to instructional design grew more sophisticated during this decade.

Morgan (1978) dates "the origin of educational technology from the work of B. F. Skinner and others on programmed instruction" (p. 143). While Sidney L. Pressey had invented and demonstrated a testing machine as early as 1925 (Olsen & Bass, 1982; Reiser, 1987), it was Skinner's elaboration of the theory of reinforcement and his advocacy of its application to learning that established the Programmed Instruction Movement.

Skinner's research into operant conditioning and animal learning led him to suggest that human learning could be maximized by the careful control of reinforcement for desired behaviors (Skinner, 1953). Hence, programmed instruction was characterized by clearly stated behavioral objectives, small frames of instruction, self-pacing, active learner response to inserted questions, and immediate feedback regarding the correctness of the response. A unit of programmed instruction was, in fact, a small instructional system (Heinich, 1970).

Though the early excitement surrounding programmed instruction was not sustained beyond the following decade, it is not difficult to see how powerful the implications of programmed instruction have been for the field of instructional development. Programmed instruction assisted in shifting education's focus to the outcome behavior of the learner and away from simple concerns with process or the behavior of the teacher. The movement reaffirmed the feasibility of self-pacing and mastery learning, and made apparent the need for carefully constructed materials. As Heinich (1970) and Olsen and Bass (1982) have pointed out, programmed instruction set the stage for the realization that the methods of programmed instruction could be applied to media other than print and on a very large scale to create macro-systems of instruction. The movement drew new professionals and perspectives into the field of education (Morgan, 1978)—the persons and the ideas that would codify instructional systems in the following decade.

At a time when the value of carefully designed, outcome-oriented instruction was being increasingly recognized, advances in the analytical procedures that would be essential to the creation of such instruction were also being made. The term *task analysis* was first used by Air Force personnel in the early 1950s to refer to procedures for anticipating the job requirements of new equipment under development (Miller, 1962). Work that began during World War II on observing and analyzing human behavior was pursued during the 1950s. Most notable was the work of John Flanagan (1954) on the critical incident technique and that of Robert Miller (1962), who developed detailed task analysis procedures initially for military applications.

Any discussion of advances in instructional design analysis would be incomplete without noting that in 1956 Benjamin Bloom and his co-authors published their *Taxonomy of Educational Objectives* for the cognitive domain. Initiated as a support for cognitive assessment, the Taxonomy was to prove extremely valuable in the specification and analysis of instructional outcomes and the design of instruction to attain them.

THE 1960s: INSTRUCTIONAL SYSTEMS DEVELOPMENT

The decade of the 1960s was so explosive for the field of instructional development that only the highlights can be included in a brief history such as this one. However, as the previous discussion illustrates, most of the ideas that coalesced during the 1960s to form an identifiable field of instructional development had been voiced previously. What was distinctive at this time was the articulation of the components of instructional systems and the recognition of their system properties.

Among the earliest authors to discuss systems were Robert Glaser (1962) and Robert Gagne (1962). In 1962 Glaser employed the term *instructional system* and named, elaborated, and diagrammed its components. He clearly described the breach between psychological research on learning and educational practice and the need for professionals actively engaged in developing the science of instructional technology. This discussion appears quaint now because of references to teaching machines and a heavy reliance on behaviorist language when describing the components of instruction, but clearly the essence of instructional development as we know it today was present. In 1965 Robert Gagne published *The Conditions of Learning*, a milestone that elaborated the analysis of learning objectives and went on to relate different classes of learning objectives to appropriate instructional designs.

Evaluation and feedback are essential features of systems. It is perhaps not surprising that the evolving concept of instructional systems was accompanied by refinement of evaluation procedures during the 1960s. It became clear that the available test construction methods that produced norm-referenced tests were inadequate for assessing the effectiveness of instructional systems. Norm-referenced tests define a learner's performance in terms of the scores of other test takers. Because instructional systems were designed to produce achievement of prespecified objectives, their assessment required tests that could be interpreted in terms of the specific competencies mastered. Reiser (1987) credits Robert Glaser with the first use of the term *criterion-referenced measures* to refer to tests of this type. The development of this alternative testing technology began in the 1960s and continues today.

The 1960s were notable for the support instructional development received from the federal government. By the late 1960s the military was rapidly infusing instructional systems development into their standard training procedures (Olsen & Bass, 1982). On the civilian side the instructional systems concept was encouraged by the passage in 1965 of the Elementary and Secondary Education Act (ESEA), which established 20 federally funded R&D laboratories. Many of these labs became advocates of ID. Through ESEA the federal government also mandated evaluation of many federally funded educational projects. While many of the labs did not survive the 1970s, the labs and the large curriculum development projects funded by the federal government in the 1960s provided visibility for instructional development and encouraged educators to accept the idea that instruction could be developed by teams of professionals outside of individual schools. The level of federal support for instructional development at that time was evidenced by the U.S. Office of Education funding of the Instructional Development Institutes, a large-scale attempt to disseminate instructional development procedures to public school teachers across the nation (Schuller, 1986).

Another important trend affecting the evolution of instructional development began in the 1960s. Leaders among education professionals who had considered themselves primarily media specialists began to lobby actively to broaden the field of audiovisual (AV) instruction to embrace the larger concept of instructional development and technology (Schuller, 1986). James Finn, Arthur Lumsdaine, and other leaders of the Department of Audiovisual Instruction (DAVI) within the National Education Association became very vocal about the need to move the AV field beyond a preoccupation with products toward a focus on the design of instructional messages. While many professionals were comfortable with the larger, more process-oriented concept, many others were not. To a certain extent, tension between "media people" and "developers" remains in the field today. Historically, however, the merger of the AV constituency with the advocates of instructional systems has no doubt had a strong impact on instructional development. Many current ID professionals and the graduate programs that produced them had their roots in instructional media. The decade ended with plans to change the name of the DAVI to better reflect the new direction of the field.

THE 1970s: ID MODELS AND MATURATION

Activities of the 1970s were a logical outgrowth of the path-breaking ideas proposed in the 1960s. The 1970s was a decade of consolidation. Instructional development acquired the accoutrements of a profession as ID scholars and practitioners sought to define and describe more thoroughly the processes they advocated. It was a decade wherein the ramifications of instructional development were discovered and recorded; its practitioners grew familiar with it.

One of the hallmarks of the 1970s was a proliferation of ID models. By 1980 Andrews and Goodson (1980) could identify 60 of them. However, experience with instructional development was revealing problems, and important and permanent modifications of the earlier models were made. One of the most important was the addition of needs assessment (Kaufman, 1972) to the collection of steps that defined the process. ID models no longer simply began with a statement of objectives; analysis processes were included to assist in determining what the objectives of an instructional system should be. Along with this greater sophistication came an awareness of the different roles an instructional developer might be required to play. The field reached out to the literature on consulting and change agents for information to assist with its growing complexity. The potential of cognitive psychology for the refinement of instructional design was noted.

Graduate education programs focusing on instructional systems design grew and existing associations of professionals were redefined to accommodate the new spheres of activity. The NEA's Department of Audiovisual Instruction became the independent Association for Educational Communications and Technology; the National Society for Programmed Instruction became the National Society for Performance and Instruction. Near the end of the 1970s AECT's Division for Instructional Development founded the *Journal of Instructional Development*.

THE 1980s: MICROCOMPUTERS AND PERFORMANCE TECHNOLOGY

The historical significance of the 1980s for the field of instructional development is currently difficult to write; only retrospection from the vantage point of later years will reveal what mattered most in our very recent past. It is hard to imagine, however, that two factors will be left out of future histories: the advent of microcomputers and the rapid adoption of instructional systems development by American businesses.

The instructional applications of microcomputers have come to dominate much of the literature of instructional design. There is little consensus regarding the meaning of this powerful technology to instructional development. Positions seem poles apart. Some regard this

high technology as an adjunct to instructional design, an ideal vehicle for researching human learning. Others seem willing to subvert the entire instructional development field to the demands of creating computerized instruction. The possibilities opened by microcomputers seem clearly to have hastened the field's utilization of cognitive psychology and knowledge engineering strategies, thus broadening its theoretical and analytical bases.

The 1980s have witnessed tremendous growth in the utilization of instructional development by businesses and other non-school agencies. These environments have fostered yet another expansion of the systems concept, performance technology. Performance technology comprises instructional technology, yet incorporates the design of non-instructional solutions to human performance problems as well. Just as the military often took the lead during the history of instructional development, the cutting edge of elaboration and applications of performance technology seems to be well outside the realm of schools and even of universities. The significance of this expanded systems concept for the future of instructional development remains to be seen.

IN CONCLUSION

The history of instructional development is about the confluence of research, technology, and systems. The beginning of the 1990s finds instructional development with these major themes still very much in evidence, albeit in much more complex and sophisticated forms. Unfortunately, the breach between educational research and educational practice described by Glaser almost 30 years ago is also still very much in evidence. The power and the promise of instructional development were and are one of the few bridges across the chasm.

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