Theories of Learning, Development, and Psychoeducational Design: Origins and Applications in Nonschool Settings

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Psychoeducational design affords plans and implementation for instruction wherever it occurs, using information from theories of psychology, education, and other disciplines. This new field has its origins in the activities of persons attempting to determine the nature and conditions of learning and trying to design effective instruction for a wide range of performances. The field has evolved from a diversity of settings including experimental psychology, applied learning research and development in the military, industry, health care, public and private education. Educational psychology offers a core of theoretical and methodological content central to psychoeducational design activities. This core includes theories of learning, development, motivation, and psychometrics as well as methodologies dealing with individual differences, the design and management of instruction, and the assessment of learning. Although psychoeducational design is a powerful technology, its focus is often too narrow and it is frequently expected to solve problems which cannot yield to technological solutions. If it is to be used wisely this new technology must be grounded in an understanding of its historical, social, and philosophical purpose and significance.

The theoretical and practical knowledge that undergirds modern pedagogy stems primarily from the disciplines of educational psychology and curriculum and instructional design. Educational psychologists traditionally have been concerned with theories of human learning, development, and motivation and with methodologies for basic and applied research, program evaluation, and individual assessment. Work in curriculum and instruction has focused on educational planning and on the development of instructional techniques, tactics, and materials. Increasingly, however, these broad domains of inquiry have overlapped. Activities representing their intersection have come to be called "psychoeducational design" (Snelbecker, 1974).

Psychoeducational design provides plans and implementation for instruction using information from theories of psychology, education, and other disciplines. This area of study is not limited to the traditional environments of formal public and higher education, but rather is committed to the systematic description, interpretation, and explanation of educational phenomena wherever these occur. Common nonschool settings include families, industries, community centers, the helping professions, and the military. Psychological theories of learning, development, and personality remain central themes in these activities but the phenomena studied are not reduced to psychological concepts and methods (Snow, 1981).

Origins of Psychoeducational Design

The field of psychoeducational design emerged from basic and applied psychological and educational research originally conducted primarily in nonschool settings. In the early 1900s academic psychology adopted the paradigms of the physical sciences. The basic thrust of psychology in the United States was to discover the scientific laws that governed learning. A set of basic relationships expressed in precise mathematical terms, similar to the laws of chemistry and physics, were sought to describe human behavior. The work of Clark Hull represents the peak of this movement (Cole, 1975; Snelbecker, 1974). During this period, experimental studies of human and animal learning conducted in the laboratory formed the core of academic psychology and the education of psychologists. Learning theorists initially expected to discover a single paradigm—or, at least, a relatively small number of laws—that would serve to explain and predict learning in all situations (Gagné, 1970, chapter 1). As the century progressed it became evident that this goal would not be reached.

Evidence rapidly accumulated that learning was not best perceived as a unitary phenomenon. Rather, it appeared there were many types of learning, each acquired by a variety of differing conditions. By midcentury, academic psychologists had adopted a "mini-theory" approach, focusing on very restricted samples of behavior in highly controlled circumstances in the interest of making strong predictions about specific learning outcomes. The older notion of finding universal laws of learning to explain all human and animal behavior was abandoned (Snelbecker, 1974).

Today, it is widely recognized that there is as yet no universal theory of learning. Consequently, there can be no general theory of instruction (Cronbach, 1975; Snow, 1977). This lack does not mean, however, that there can be no local theories of instruction, valid in terms of types of learning required to achieve particular educational outcomes in particular learning environments with different types of learners. The construction, implementation, and validation of such local instructional theories is the province of psychoeducational design.

The approach to instruction taken by Gagné is an example of local theory construction typical of psychoeducational design. Gagné identifies eight categories of learning, each with its own set of permitting and optimizing conditions, and five major domains of learning, each corresponding to a significant type of learning outcome (Gagné, 1977; Gagné & Briggs, 1974). Some researchers, such as Case (1975) and Cole (1970), integrate aspects of the instructional theories of Gagné, Bruner, and others with aspects of Piaget's developmental psychology, and with respect to particular content and skills to be taught. In this fashion, the study of psychoeducational design frequently results in powerful

insights into ways to design instruction and promote learning in specific subject areas for specific populations of learners (Cole, 1971; Lacefield, 1981a).

National Defense and Psychoeducational Design

During the first half of this century a number of factors contributed to the transition of a psychology of learning patterned after the physical sciences to a psychoeducational design approach influenced by the social sciences and educational technology. The first was psychometrics, the measurement of mental abilities, especially intelligence. Around 1917, a number of prominent American psychologists (many of whom were affiliated with the Eugenics Research Association) influenced the military to use group administered intelligence tests that these psychologists were then developing (Kamin, 1974). Soon these and other tests that measured achievement, aptitude, occupational preference, character, and personality were developed and used widely, not only in the military but also in secondary and higher education, business and industry, and governmental agencies. The measurement of human traits and abilities became a major tool to sort, screen, and rank individuals. Immigration quotas, admission to educational programs and institutions, and employment opportunities of all sorts were linked to test scores (Kamin, 1974, 1982; Perkinson, 1977). This sorting and screening function through testing continues to the present day as a major activity of school psychologists, counselors, clinical psychologists, college admissions officers, educational diagnosticians, and personnel officers in business and government. Persons with expertise in psychological assessment work in many different settings including all levels of the educational system, health care facilities, the military and civil services, business and industry, and many professional and technical societies (McClelland, 1973).

A second factor in the development of psychoeducational design was the large-scale World War II military draft of persons with expertise in learning theory, personality theory, and psychometrics. The learning theorists were expected to design efficient programs of instruction for large numbers of military personnel. The skills to be taught were extremely diverse: e.g., learning to discriminate one's own aircraft from those of the enemy (to avoid shooting down the wrong planes); heavy machinery operation; electronic equipment repair; map reading; survival tactics; and exhibiting leadership abilities required for military command. Writing about this period, Gagné (1962) notes that prior academic and experimental psychology could prescribe very little for these types of applied learning problems. Rather, what occurred was the creative extrapolation from earlier work in experimental psychology to the development of a new psychology of instruction. Gagné's own method of task analysis and instructional design, so popular today, were forged in this crucible of military necessity.

The psychometricians who were drafted and others who remained in academic settings were enlisted to perfect additional tests for the rapid and efficient screening of military personnel for the wide variety of roles needed. During and following the war, more tests and diagnostic procedures were developed to determine the nature and extent of neurological and psychological injuries resulting from wartime traumas. The movement became institutionalized in Veterans Administration hospitals.

During the same period, personality theorists, developmental psychologists, and other social scientists and helping professionals also were involved by the military in the development of programs to rehabilitate military and industrial personnel injured by the war. These new approaches combining both psychology and education led to the further development of specialty areas including rehabilitation counseling, occupational and recreational therapy, clinical psychology, and later on, special education. These emerging specialties were concerned centrally with teaching skills and attitudes needed to restore persons to effective levels of coping. All relied extensively on principles of learning, development, and personality as a basic core of knowledge. But none relied solely on this content. Each developed its own specialized body of knowledge and methodology. Increasingly all have come to evaluate the effectiveness of their programs and methods with formative and summative evaluation methods which developed concurrently in response to demands for accountability (Cohen, 1977).

A third factor related to the development of psychoeducational design was the work of experimental psychologists, both within the military and at research institutions supported with federal funds. Experimental studies of learning, perception, cognition, information processing, and psychomotor skill development were basic to the design of electronic communication systems and human/machine interfaces required by modern aircraft and sophisticated weaponry. The cognitive psychology and information theory which developed from this human-factors engineering activity in the military has become increasingly utilized in a wide range of educational activities, including the teaching of reading and computer aided instruction (Garner, 1962; Lumsdaine & Glaser, 1960; Neisser, 1967).

In the cold war following World War II, the National Defense Education Act (NDEA) became another significant factor contributing to the development of psychoeducational design. This act grew out of national concern that the United States was falling behind the Soviets in key areas of science and technology. In 1949, President Harry S Truman declared education to be the first line of defense for the nation. Somewhat later, in 1958 after the USSR launching of Sputnik I, the U. S. Congress passed the NDEA.

This act had three basic thrusts. First, it was to develop a cadre of professional guidance counselors trained in the scientific testing and selection of persons for careers in the scientific and technical professions basic to the accomplishment and well-being of the nation. Second, the act sought to improve the quality of the science and mathematics curricula in secondary schools and colleges. The third thrust was the development of vocational education programs for those persons who could not be educated for scientific and technical roles but who were needed to maintain a strong and well-informed industrial work force.

During the next seven years, the NDEA legislation was expanded to include other curricular content areas and instruction at the elementary level. Monies from this legislation supported the curriculum development movement of the 1960s; the large-scale development of programs in counseling, vocational education, and science education at the college and university level; and the construction and improvement of facilities for scientific and technological instruction (Perkinson,

1977). The number of persons involved in psychoeducational design activities increased greatly because of this legislation.

This brief historical review illustrates that many of the educational practices occurring today in both school and nonschool settings developed originally outside the schools in a diversity of settings where psychologists, educators, military personnel, industrial personnel, and others were trying to design instructional systems to better select, train, educate, or rehabilitate some population of persons. More often than not, these populations were located in settings other than schools. Today the theories, design principles, and educational technologies that were developed in these diverse contexts are profoundly affecting educational practice in schools and elsewhere.

A Content Core for Psychoeducational Design

In a study of the content of educational psychology courses Cole and Musser (1977) found three areas of theory and three methodological emphases central to the discipline. These are theories of learning, development, and motivation and techniques for dealing with individual differences, the design and management of instruction, and the assessment of student learning.

Learning theories are used to explain the varieties and conditions of learning, the transfer and generalization of learning, and the integration of accumulated learnings into complex skills and abilities. Theories of human development are used to explain patterns of cognitive, social emotional, and moral growth throughout the lifespan. Theories of motivation focus on the reasons for purposeful behavior and explain the relationships among the constructs of learning, developmental readiness and interests, and performance capability. Together, these three bodies of theory describe human behavior and behavior change. As Neisser (1975) has pointed out, a primary purpose for teaching persons about these constructs is to assist them in understanding and explaining the phenomenological transactions in which they are involved with the world and other people.

Complementing these core areas of theory are three clusters of methodology useful to the teaching activity. The first concerns methods by which to recognize and deal with inter- and intra-individual differences in knowledge, ability, maturation, emotional response, and learning style. The second area focuses on techniques for the design and management of group and individual instruction. Understanding, formulating, and using various types and levels of objectives; selecting and designing appropriate content, topics, tasks, and instructional methods and materials for different objectives and different populations of persons are included in this area. The third area of basic technique involves the assessment of persons' learning resulting from instruction as well as the evaluation of the effectiveness of the instructional program or curriculum.

These core theories and methods are central to the practice of psychoeducational design regardless of the setting. Persons well-versed in this content of educational psychology are actively engaged in the design, implementation, and evaluation of educational programs wherever these occur (Fraser, 1981; Shuell, 1981; Snow, 1981). Increasing numbers of nurses, allied health professionals, social workers, pastoral counselors, consumer advocates, and other helping professionals are enrolling in educational psychology courses. In some institutions enrollments from these fields outside of teacher education make up as much as 75% to 85% of graduate level educational psychology courses (Cole, 1978). The course content appeals to these persons because they too are educators concerned with helping their clients acquire new knowledge, attitudes, and skills.

Educational Studies Inform Psychoeducational Design

Scholars engaged in the philosophical, historical, and social study of schooling identify major issues and paradoxes concerned with goals, curriculum, human development, and learning. The work of these educational theorists is as important to educational activities in nonschool settings as it is to understanding schooling in traditional private and public educational institutions.

In *The Real World of the Public Schools,* Broudy (1972) succinctly describes three teaching modes which he calls didactics, heuristics, and philetics. These correspond closely to the three domains of learning outcomes described by Krathwohl, Bloom, and Masia (1966). Broudy's first mode is didactics, the transmission of information, knowledge, and basic cognitive skills. It has been and remains a primary aspect of professional and technical education in and out of school settings. Didactic instruction occurs primarily in classrooms and is organized around conventional lecture, demonstration, and recitation formats. The second mode is heuristics, which emphasizes practical experience and experiential learning. The last mode of instruction, philetics, deals with love, values, and affectivity. Its expression is more diffuse throughout the curriculum, having to do with the tutorial relationship between the teacher and student.

Although Broudy's observations are based on an analysis of public school education, they are valuable for thinking about other types of educational activities, such as those that occur in the activities of health professionals.

Psychoeducational Design, Educational Theory and Health

The Health Professionals Education Assistance Act of 1963, its subsequent extension by amendments through 1968, and the Comprehensive Health Manpower Training Act of 1971 involved the employment of educational psychologists, curriculum and instruction specialists, and program evaluators on a large scale (Cole, 1978). Initially, activity focused on improving the quantity and quality of professional health care training, with the expectation that better trained practitioners would subsequently provide better care to their clients. Later, the emphasis changed to teaching health professionals how to become good teachers themselves in order to provide patients with information and to persuade them to follow medical regimens. Instruction of health providers was almost entirely devoted to didactics and heuristics with little attention paid to

critical affective areas of professional practice. This slighting of philetic modes of instruction has been detrimental to professional education and, perhaps, to the practice of these professions (Cole & Lacefield, 1978; Lacefield, 1981a, 1981b).

The same pattern can be seen in the modes of instruction health professionals learned to use with their patients. Didactics, and to some extent heuristics, were used to convey to clients the things they needed to know to follow treatment plans and become well. Patients received information about their health problems regarding diet, exercise, smoking, and medication and then were expected to change their behaviors in ways rationally consistent with medical advice. This problematic area has come to be known as patient education, management, and compliance. Unfortunately, what stands out is that many persons do not comply very well under this set of instructional procedures and contingencies.

"Behavioral health" is a relatively new, interdisciplinary field concerned with promoting understanding and maintenance of good health and prevention of illness (Matarazzo, 1982). It has become increasingly clear that both the re-education of persons to foster more healthful lifestyles and the interest in developing such patterns of living to begin with are matters requiring much greater attention to philetic modes of instruction. Lifestyles are closely related to strong underlying values that may promote or prevent healthy behavior. Simply knowing what one should do and how to do it are not sufficient in the absence of supporting beliefs and motives.

The literature of the health professions is replete with applications of teaching methodologies developed in traditional educational settings and then extended to teach individuals and groups about health care. A specific example of the recognition of the philetic mode in health includes efforts to apply Brown's concepts of confluent education in courses for physicians to teach them to better deal with their own fear of death so that they in turn can be more effective in educating family members about the needs for autopsies on loved ones (Helder, Verbrugh, & de Vries, 1977). Another example involves the use of cognitive psychology, Piaget's developmental theories, and Gagné's instructional principles to teach diabetic children to cope with their illnesses. In this case, knowledge of the illness, the control of diet, and use of insulin is not enough. Children also need skill in the management of fear and other emotions that are present and must be dealt with for the treatment to be effective (Friedland, 1976).

Another, more generalized example of the transfer of ideas and methodologies from school to nonschool settings is offered in the work of Cole and Lacefield (1978) and Lacefield (1981b). Seven of broad cognitive and affective skill domains were postulated initially as areas basic to good teaching in traditional school settings. Later studies showed that these same skill domains were regarded as essential for sound professional practice in a wide variety of helping disciplines (allied health, dentistry, nursing, counseling, social work, home economics, and others). Paradoxically, these studies also revealed that although the more affective skill domains were considered essential, professionals were less sure that they could be taught and evaluated successfully; were uncertain whether such skills should be taught explicitly in training programs; and were reasonably certain that these affective competencies were not presently graded

The tendency to abdicate responsibility in affective areas of the curriculum while asserting responsibility in cognitive areas and the corresponding lack of emphasis on philetic instruction has been identified as a long-term problem in American education. It is apparently related to such fundamental ideals as separation of church and state and taboos against the indoctrination of persons in values and attitudes (Krathwohl, Bloom, & Masia, 1966). This paradoxical situation extends into the education of scientists and professionals, even in situations where the values and attitudes in question are clearly legitimate educational goals essential to effective practice. There is evidence, however, that these circumstances may be changing. Breen, Donovan, and Whitaker (1977) surveyed programs for preparing helping professions across 80 institutions of higher education. They report renewed interest in affective learning outcomes and philetic areas of the curriculum.

Unreasonable Expectations for Psychoeducational Design

As is too often the case with technology in general, in psychoeducational design there is a tendency to become too narrowly focused. This trend is evident in the design of instruction in both the public schools and in other nontraditional educative settings. The use of behavioral objectives is one example. As recently as a decade ago, teachers and other helping professionals were being taught to develop huge lists of precisely stated objectives and "competencies" without much attention to the broader purposes of instruction. Too frequently, the results were long lists of trivial or unrelated tasks for learners to accomplish with little sense of why these specifics were important, how they were related, or how they could be used in meaningful ways. Available logical means for establishing different levels and functions of objectives to serve a variety of human purposes were ignored (Krathwohl, 1965). The use of behavior modification in similar narrow and uninformed ways is still another example of how educational practice became victimized by an uncritical acceptance of technology (Winett & Winkler, 1972).

A current psychological reductionism seeks to explain all mental illness, addiction, and learning disorders with concepts of biochemistry and neurophysiology. Under this paradigm, treatment of mental disorders and learning disabilities takes the form of chemotherapy rather than education (Bassuk & Gerson, 1978). However, Peele (1981) argues convincingly that psychological constructs and explanations will always be needed to assist professionals in understanding their own and their patient's subjective experiences. For example, Peele demonstrates that addictive behavior, long regarded as a symptom of biochemical dependency, can be better explained in rats and people by the constructs of cognitive psychology. When a rat or a human cannot avoid painful stimuli with other coping strategies, both will rely on narcotics to lessen the pain if these are readily available. However, when the rat or the human has other means to avoid pain, frequently both will spontaneously cease to use the narcotic earlier relied on as the sole recourse. This rapid cessation of the use of a supposedly "addictive" drug with an increase in the organism's control of the environment suggests the biochemical explanation of addictive behavior is inadequate.

In *Walden Two* (1948) and many subsequent articles, Skinner advises educators and others to adopt the technology of "behavioral engineering" and to ignore the misleading and confounding disciplines of history, philosophy, and ethics as serious areas of study. In large part, persons in the helping professions have followed this advice.

Historically, educators in a variety of settings have become enamored with the "technical thesis": the idea that all problems have a technical solution; that there are no unresolvable paradoxes but, rather, only problems whose solution awaits a more powerful technology (Postman, 1979). May (1976) points out that such attitudes are destructive to the individual and that they frequently create unrealistic expectations, a sense of failure, anomie, and depression. Perkinson (1977) demonstrates that Americans have always placed an unwarranted faith in the technology of education in public schools to solve social problems. A similar pattern is replicated in the health professions as they rely more heavily on technology to overcome illness and disease (Pellagrino, 1974). Postman (1980) also argues that the unrealistic expectations embedded in the technical thesis are destructive to education because they promise more than can be delivered, create misinformed publics, and cause great bitterness when they fail to materialize.

Conclusion

Psychoeducational design is a powerful technology rooted in theory and methods adapted from psychology and education. This new field of study has a rich interdisciplinary history and finds application in a wide variety of instructional situations. It has great potential both for use and abuse. If it is to be used wisely, the practice of this new discipline should be grounded in an understanding of its historical, social, and philosophical origins. Perhaps the moderation of this powerful technology by educational critics and scholars in the tradition of Broudy and Perkinson is the most needed contribution to the area of psychoeducational design wherever it is practiced.

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