

1. VOICES OF THE FOUNDERS: EARLY DISCOURSES IN EDUCATIONAL TECHNOLOGY

Ann De Vaney

UNIVERSITY OF WISCONSIN AT MADISON

Rebecca P. Butler

EASTERN TENNESSEE STATE UNIVERSITY

Discourses and their related disciplines and institutions are functions of power: They distribute the effects of power. They are power 's relays throughout the modern social system (Bove, 1992).

. . . and when we got over to England, they didn't even know what the hell we were. They called us the audiovision boys. They thought that we had to do with hearing aids, improving of hearing and so on (Schuller, 1978).

1.1 INTRODUCTION

Educational technology is such a young and amorphous field that confusion about its objects of study, its audience, and the parameters of its operations is almost as common today as it was for Charles Schuller during World War II. Yet at the onset, only a few educators with a common goal to improve education through technology generated national interest in their cause, devised curricula, started graduate programs, and produced a spate of diverse texts while establishing new terrain in the academy. While academic audiovisual and educational technology programs started in the 1950s and proliferated in the 60s, the intellectual groundwork for this area emerged in the late 20s and peaked in the 40s with the capstone event of programmatic and extensive war research. Since texts produced during this time, 1932 to 1947, and oral accounts of this period form a solid base for the establishment of an academic field, we will consider these documents in our examination of the early history of educational technology.

Often, educational scholars, in and outside of educational technology, yearn for and pursue a monolithic academic project that would, once and for all, provide a unified definition of their enterprise and offer an objective account of their operations. While this is a futile exercise for social scientists who study human beings and their activity, it was and is a legitimate goal for academics working under the aegis of logical positivism. The fact that past and present educational technology scholars have failed in this monolithic effort is to the credit of the field. Heterogeneous texts produced during the period under consideration and later provide a rich account of objects of study, theories engaged, methods employed, and audiences included. The written and oral texts considered here disclose a set of common goals

but are diverse projects whose structures are contingent on historically accepted concepts and values. They reflect prevailing notions of learning theory and pedagogy, research methods, economic, military, and political values, and other elements of the social milieu in which they were produced. The iterations of names, concepts, assumptions, and theories in these texts not only promoted ideas but actually created truisms in the field for the time in which they were written. The value of these texts cannot be measured by sophisticated standards of current research, nor by highly evolved notions of learning theory, but by how they achieved their common goals when they were written. From whatever perspective these authors spoke, we might ask how well they made their objects of study intelligible to specific audiences at specific moments in time. The rhetoric with which they spoke and the discourses that spoke through them energized an audience of scholars, educators, and students to participate in a new field, educational technology. By any measure they were successful.

It is with respect for the success of the founders of the field of educational technology that we attempt, from our specific moment in time, within our own community to describe the discourses of their early documents. Within this project we value the mutability and diversity of educational technology.

1.2 EARLY EDUCATIONAL TECHNOLOGY TEXTS

When people approach us today they are often as confused about the title, educational technology, as they were about its predecessor, audiovisual instruction. Educational

technology is often mistakenly equated with computer education or instructional design and for several years, in the '60s and '70s, definitions of the title and terms of the field proliferated. But definitions are historically contingent, and in a field constructed around ever changing notions of technology, definitions as well as machines have obsolescence built into them. Definitions, while helpful, can be limiting and a description of the establishment, operation and reception of a field may yield more understanding of its nature and scope than definitions. Imagine, for instance, what happens to many '60s and '70s definitions of educational technology concepts in light of virtual reality, or in light of all the new and startling research on the brain and the mind. What happens to definitions of interaction in virtual environments, and what happens to descriptions of learning from media in the new world of constructivist cognitivism? While not eschewing definitions, we will in this chapter, try to examine the manner in which early discourses spawned the field of educational technology. When definitions are employed, we will attempt to place them in their historical context.

Within any discipline the construction of knowledge and its subsequent cultural practice is always elusive. Yet, within each field there are specific early primary and secondary texts that have been authored and received over time. If carefully read, these texts can yield voluminous information about the formation of a field, such as who the founders were, which discourses influenced their communications, and to whom and with what authority they spoke. In psychiatry, for instance, one could analyze the primary texts of Freud, Jung, and Adler and the secondary texts of their disciples. In a field as young as educational technology, many early texts are available for analysis and may provide information about how specific discourses became inscribed in this area of scholarship.

This chapter will not be a traditional history of educational technology for several reasons. Paul Saettler (1968 and 1990) has written an admirable history of the field, and that task need not be repeated. We are also limited by the strictures of one chapter. Since this is a handbook of research in educational technology, we have limited our investigation to a consideration of how knowledge in the academic field of educational technology was generated.

1.2.1 Purpose

In this chapter, we analyze early educational technology texts to ascertain the manner in which founders of the field constructed the base of knowledge that was to constitute educational technology. We explore their discourses to discover which ideas were included and which excluded from their writings; we examine how they spoke and with what authority; and we describe discourses they offered their readers. More specifically, in the early texts we locate repeated statements that describe concepts, theories, pedagogy and values and trace them to discourses outside the emerging

field. We also attempt to describe the formation of discourses within the field. In tables of contents and indices, we explore the organization of information in the field by noting the hierarchy of topics and the inclusion or exclusion of subject matter. In prefaces and forwards, we investigate the intentions of the authors and note with what authority they speak. Additionally, we tell the stories of early women in the field.

1.2.2 ORAL HISTORY

Edgar Dale, speaking with the authority of a renowned educational scholar, offers a description of some early (1930s) objects of study and intended audiences in the emerging audiovisual field.

Well somewhere or another I got the concept there was a lot of rich knowledge available, and we ought to have some techniques for moving that rich knowledge into the minds and hearts of people. So I began —I didn't use the word then. I got the word (later) from Charters of — communication. And so there was this sharing of ideas and feelings in a mood of mutuality. Here's all this information the librarians want to share; the teachers want to share, but it isn't available; it isn't packaged right; it isn't written right; it isn't pictured right, and so on. [italics ours] (Dale, 1977)

In this humanistic description of a nascent field, Dale suggests what would be studied, communication, packaged information with pictures and text; who would benefit, librarians and teachers, and most importantly identifies the professional esprit we found so common in the taped interviews. This rhetorical strand is woven through all the oral histories. We have reason to believe there was an authentic sharing of ideas and mood of mutuality.

This mood is echoed in James Brown's statement. Many people were enthusiastically believing such things (that films would change education)...It made a difference in their attitude toward education. There were a good many people who became convinced that this was a way of making education a good deal more effective than it had been. (Brown,n.d.).

In describing what constituted the field, Kenneth Norberg addresses theoretical objects of study which came to be articulated and notes a discursive rift among scholars.

...I was interested in Jerry Torkelson's statement which he made a year or so ago, when he was still president of AECT, that the critical word in our association name is communications and he went on to say that technology was secondary, in the sense that it implies a systematic approach to the solution of communication problems in an educational setting.

It seems to me that there are some unresolved conflicts - possibly-in the notion of what our field is. ...I think there is a kind of theoretical rift between the communications people and the instructional development people who have been strongly influenced by learning psychologists, particularly behavioristic psychologists. (Norberg, 1977)

Walter Wittich, in retrospect, speaks not of the objects of study, but of the gate keeping and mode of entry into the later field.

Well professionals are professionals. By that I mean that they have gone through a sequence of professional work which has been carefully designed to induct them into the strategies, into the philosophies, into the systems of the field, which is something that I -I say this unabashedly - I never had the advantage of. Because when I went looking for courses in the field, when I was working on my Ph.D...and the education dean at the University of Wisconsin (John Guy Fowlkes) had to write a course so that we (Charles Schuller and Walter) would have something to take. This was way back in late 39. (Wittich, 1972.)

And Elizabeth Golterman challenges the received wisdom about when the field started.

Many people, now that I'm retired think of me as an audiovisual pioneer, but actually, in 1930 when I became a member of the staff of the St. Louis School Audio Visual Center, I was joining the staff of an institution that had begun back in 1904, and had been reaching classrooms through weekly deliveries (of media software) since 1905. So that it had had 25 years of experience when I became part of it. (Golterman, 1976)

1.2.3 Theory and Analytical Technique

Methods for reading these early written and oral texts are available to us. Post structural reader theories provide an epistemology which frames this study, because according to these theories, truths are socially and linguistically constructed within and only within a discourse; they cannot be submitted to a transcendent authority for proof. Reader theories also supply us with a conceptual frame for a consideration of text, author, subjectivity and discourse. What many of these theories fail to supply is an analytical technique, since they are, by and large, a-methodological. In this study we have adopted a post structural perspective to read historical texts and appropriated neo-rhetorical devices for our method of reading. Such methodological and theoretical pairings are gaining a foothold among scholars who analyze text (Rooney, 1989; Maillioux, 1989; Morrison, 1992). We will describe our adaptation of specific reader theory concepts and neo-rhetorical analysis for this study.

1.2.4 Readers, Texts, Discourses.

While notions of text, author, subjectivity and discourse are properly contested within post structural literature, the presence of these concepts provides the paradigm with some cohesion. If one is to conduct rhetorical analysis within a post structural frame, one must come to an understanding, however tentative or short lived, of these central concepts.

We consider our historical resources here to be physically bound texts that have been constructed with intent by authors; they contain socially encoded messages which may be variously interpreted by readers. Readers, however, must

have linguistic access to the community which has encoded the message. We consider discourses, here, to be texts "writ large." They, too, have been constructed with intent by authors; they contain socially constructed messages which are variously interpreted by readers. While hard to define, discourses are invisible systems of thought (Bove, 1990) which operate at a linguistic level to produce and regulate knowledge. All communications are discourse specific, that is, they are rhetorically related to a system of thought which includes specific concepts, theories, assumptions and values, while excluding others. Authors, by the virtue of the rhetoric they employ, are subjects of discourses; they produce only discourse specific communication and discourses speak through them. Authors offer potential readers invitations (Ellsworth, 1988) to believe in the discourses or systems of thought embodied in their texts.

1.2.4.1 Rhetoric. Rhetorical analysis, new or old, is concerned with the structure of a communication, such as a narration or an exposition. Even though the distinction between these two genres is blurred today in some scholarly circles, an analyst can locate significant rhetorical sites by examining traditional techniques for exposition in scholarly books and narrative in oral histories.

Our rhetorical techniques, then, include three approaches. To locate concepts, theories, assumptions, and values in expository texts and narrative texts, we examine the structure of the communication and question the text at specific organizational sites in the main sections or body of the texts. By examining the table of contents and indices of many old educational technology resources, we note the hierarchy of topics and the inclusion and exclusion of subject matter. In prefaces and forwards, we investigate the intention of the authors and note with what authority they speak. We group and relate our linguistic findings to the discourses from which they came. This is not a neat procedure, for as can be expected, there are many overlapping and conflated messages. Discourses are hard to pin down, but their operation can be seen. The specific rhetorical structure of one text acts like a vector which identifies the bodies of discourse from which it was drawn. We also explore the rhetoric of early women in the field.

1.2.4.2 Textual Sources. Representative historical (approximately early 1930s to early 1950s), educational technology texts were submitted to rhetorical analysis. They include oral history audiotapes of the founders of the field, research reports, technical manuals, journal articles, textbooks, and books addressing theory, pedagogy and application. The value of articulating the linguistic presence of both dominant and subordinate discourses in these texts is to demonstrate a difficult process, to provide a partial example of the production, regulation, and institutionalizing of knowledge. Hopefully these analyses will partially explain how this happened and why similar discourses continue to shape the field of educational technology today.

1.3 OVERVIEW

1.3.1 Between Two Wars

Even though the modern field of educational technology emerged from training research of World War II, the objects of study, basic concepts, and intended audience had been circumscribed in the period between 1918 and 1941. While assessment of the efficacy of the Yale photoplays represents the first school research with students and film, earlier research on the value of health training films during World War I had been conducted. Between the wars, however, the area of audiovisual instruction for students was promoted by interested educators, librarians, school administrators, filmmakers, radio program designers, textbook producers, and other media enthusiasts throughout the country. We might say that early audiovisual practice was multivocal. Also, supporting the new audiovisual area was a substantial body of scholarly books and textbooks that were published in this period. The interest of educators in the field and researchers in the academy produced a flurry of additional books about classroom application of audiovisual instruction and building and district administration of audiovisual programs. We shall refer to all of these books as texts. Oral history audiotapes will also be called texts.

Audiovisual texts produced between the two wars were of several types. Late-20s and early-30s faculty research reports, published by university presses, were representative of prevailing scholarship of the decade. While seldom addressing the learning theory that informed their method and design, these texts reflected a heightened interest in connectionism and a growing reliance on statistical measurement, which was prevalent in the new departments of educational psychology. We speculate that these departments, many of which were established in the 20s, gained a foothold in the academy by imitating the practices of animal psychologists. We do not suggest that this was a self-serving move but one in which educational psychologists believed would bring rigor to an ill-formed field, education.

The applied audiovisual texts of the late 20s and early 30s reflect little research or learning theory. Rather, they were concerned with the operation of machines in public school classrooms, buildings, and districts. This direction was, of course, necessary, since most practitioners and potential practitioners were ignorant of the operation of these machines.

A different type of text, however, emerges in the late 30s and continues through the 40s. It is a text that attempts to ground audiovisual instruction in a learning theory and describe the manner in which theory suggests certain pedagogical practices. It is both theoretical and applied. The rhetoric of these texts engages the dominant educational discourse of the period, mid-30s to late 40s. It was a Deweyesque, child-centered, humanistic learning, and curricular theory. (That does not mean there was no behavioral subtext during this time. Learning theories, like discourses, are not pure,

but conflated.) Atheoretical applied texts were still written during this period, but they proliferated in the area of audiovisual administration rather than pedagogy or instruction. Since this is a handbook of research, we have focused on the period from approximately the early 30s to the early 50s and on texts primarily, but not exclusively, produced in the academy. We have included chapters, but not whole texts devoted to administration of audiovisual programs. To understand the rhetoric of these texts, we provide some historical information about the context in which they were produced.

1.4 EDUCATIONAL TRENDS: LATE 20s AND EARLY 30s

When the National Academy of Visual Instruction (NAVI) merged with the Department of Visual Instruction (DVI) under the auspices of the National Education Association (NEA), the year was 1932, and the country was in the midst of a recession. Opposing national voices in the ongoing struggle for educational reform were surprised by the hybridized nature of local school reform. A bipolar debate for dominance of the U.S. curriculum had been mounted in the early years of the century and had reached a fevered pitch in the mid-20s. Kliebard (1987) characterizes these factions as social efficiency theorists and child study or developmental theorists. The manner in which these camps articulated their beliefs in curriculum theory and educational practice in the 1930s is important here, because their opposing discourses underpin the writings of audiovisual educators and researchers in the decade. Also, it is important to remember that the audiovisual movement was school based.

1.4.1 Social Efficiency

The powerful social efficiency movement, which borrowed ideas of social control and stability from Edward Ross and notions of efficiency from Frederick Winslow Taylor (Kliebard, 1987), spawned an interest in the comparable studies of behavioral psychology and mental measurement. "It was social efficiency that, for most people, held out the promise of social stability in the face of cries for massive social change" (Kliebard, 1987, 1989).

Early in the century, we hear John Franklin Bobbitt talking about the "scientific management" of education, the "elimination of inefficiency," the "platoon system," school superintendents as "educational engineers," and the school as a "plant" (Kliebard, 1987, pp. 97-99). While it was Taylor (1911) who actually introduced the business world to the twin gods of efficiency and effectiveness, it was Bobbitt and other early educational researchers and administrators such as Ellwood and Ayers (Kliebard, 1987, pp. 103-104) who graced the national educational discourse with that indelible metaphor of the school as a "factory."

1.4.2 Child Development

In opposition to the social efficiency movement, interest

in child study or development grew in the early part of the century and had vocal proponents in the 1920s. Hall, Kilpatrick, Dewey, and others believed “that somewhere in the child lay the key to a revitalized curriculum” (Kliebard, 1987, p. 160). While generating varied child development theories, these scholars opposed the reformations suggested by the social efficiency movement. They felt that “education should be considered as life itself and not as a mere preparation for later living” (Kliebard, 1987, p. 162). (Although both movements claimed John Dewey, his experiential theories are more aligned with the child study group. He did, however, disagree with both groups on many points.) Like the social efficiency educators, child developmentalists believed that public school curriculum needed reform; students needed to participate in purposeful activity. To this end, Kilpatrick, diverging from his teacher Dewey, introduced the Project Method of education, which was to address, in an integrated manner, the problems of living. Child interests and their life activities were used as curriculum guides:

By the 1930s, the Project Method movement had grown to such proportions that it outgrew its original identification with the project per se and came to be more grandly advertised as the activity curriculum or the experience curriculum (Kliebard, 1987, p. 168).

These utilitarian and pragmatic curricula were-not the sole domain of elementary or secondary schools but were influential in determining experimental education at colleges such as Bennington, Sarah Lawrence, and a general college at the University of Minnesota (Brubacher & Rudy, 1968). We see the humanistic and pragmatic influence of this movement in the late 30s and 40s in the work of Dale and others.

1.4.3 Mental Measurement

At the same time, influential metaphors were being generated by another arm of the social efficiency movement: the mental measurement proponents. Thorndike’s contribution of the mind as a machine with multitudinous, discrete, and nonconnected parts remains with us today. Indeed, Thorndike, along with Goodard, Terman, Yerkes, and others, was responsible for the application of the IQ scale as a vehicle of social control, not just a diagnostic test (Kliebard, 1987).

Child development proponents were not the only educators who highlighted student needs. The social aspects of the efficiency movement also stressed education according to student needs; mental measurements allowed educators to ascertain those needs; and activity or job analysis became the means by which new curriculum was developed. W. W. Charters, who later figures prominently in the audiovisual movement, was one of the first educators to compile activity analyses for the tasks of such occupations as librarian and veterinarian (Kliebard, 1987). He transferred his model of task analysis to the curriculum for Stephens College in Missouri (Brubacher & Rudy, 1968).

Speaking of Charters and his early influence on curriculum theory and the emerging audiovisual field, Edgar Dale says:

(Charters) had this whole idea of analysis of activities.... Now we’d call it, I suppose, behavioral analysis.... A very concrete approach to curricular processes (Dale, 1977).

But as Dale was learning Charters’ activity analysis in the 30s and applying this curriculum technique to an articulation of Carleton Washburne’s Winnetka plan, he was critiquing it:

... And the individualized instruction involved analyzing a subject like arithmetic, loading the key steps, then preparing a set of almost textbook experience. So you would do a step at a time, take a test on it, take another test on it, and so on. And I thought it was very fruitful in terms of applying some of the Charters’ approach. [There was] the old weakness of any kind of individualized instruction where you take it step by step, and you don’t have the chance to de the material together, to integrate it, and so on. That, that difficulty I thought of right along (Dale, 1977).

1.4.4 Learning Theory

One aspect of the curricular debate at this time influenced the research practices in our field, early and late. Aspects of early behaviorism need our attention (see 2.21.3). Educational psychology was dominated by Edward Thorndike in the early decades of this century (Guthrie & Powers, 1950; Hilgard, 1948; Kliebard, 1987), perhaps because he straddled the disciplines of psychology and education. Before the turn of the century, he had described his basic tenets of learning in *Animal Intelligence* (1898), and even though he applied his theory of connectionism to human beings in *The Psychology of Learning* (1913), it was not until the 30s that he elaborated his premises (Thorndike, 1935). Prior to that time, he applied his theory to education and mental measurements. Basically, he believed that the association between sense impressions (stimuli) and impulses to action (response) was the arena in which learning took place. His connectionism was an associative theory that peaked the interest of later (30s and 40s) psychologists concerned with the issues of learning and education. Guthrie, Skinner, and Hilgard, publishing in the 30s and beyond, and Hull in the 40s and beyond, each contributed their own behavioral theory to the scholarly and practical area of learning in the United States. Embracing the ideas of congruity and association as a basis for learning, these men left an indelible mark on the rhetoric, discourses, and practices of the fields of educational psychology and educational technology. (For many decades educational technology research projects appeared to be simply limitations of educational psychology projects.)

Educational psychologists were not only influencing technology research but also publishing in the field. Hilgard, a popularizer and synthesizer of behavioral theory, contributed an important chapter in an influential audiovisual text, *New Teaching Aids for the American Classroom*, and is of-

ten cited in World War II research. Thorndike's name and, consequently, his brand of behaviorism, connectionism, appears in 30s audiovisual research reports. Hull's systematic behavioral theory appears in the 40s and 50s research of Neal Miller (1941, 1957). Another disciple of Hull whose work influenced educational technology scholarship was Albert Bandura, upon whose human modeling theory Gagne and Briggs (1965) based their Conditions of Learning.

A general definition of learning to which most of these behaviorists subscribed is offered by Hilgard:

Learning is the process by which activity originates or is changed through training procedures (whether in the laboratory or in the natural environment) as distinguished from changes by factors not attributable to training (Hilgard, 1948, p.4).

Neobehavioral theories, especially operant conditioning, provided a rigorous scaffolding for research in educational psychology from roughly the late 30s to the 70s and garnered for this field a reputation of serious scholarship in the academy. While educational technology was never accorded the same academic respect, most researchers in this field did imitate the learning theories and research methods practiced by educational psychologists. Educational psychologists gained the respect of arts and science colleagues by attempting to make the study of student learning as scientific as had the academic psychologists the study of animal learning. Although educational technology researchers adopted the behavioral posture of their colleagues, their reputations were tainted by their connection with audiovisual machines-not considered by many academics to be worthy of scholarship -before the advent of computers. If any one value was articulated in most academic discourses we examined, it was the valorization of words, especially words in print. (Such a value, in fact, may have led one leading researcher [Clark, 1986] to conduct a meta-analysis of educational technology research and conclude in 1986 that machines do not affect learning, and that media are dead when considered as variables in a learning experiment.)

The stature that educational technology scholars gained by adopting neobehavioral theories and practices was mitigated by other losses. If a discourse is a system of thought that produces knowledge, examination of the concepts included and excluded from the neobehavioral discourse will provide a partial understanding of the intellectual underpinning of educational technology. Within this discourse, the mind was considered a tabula rasa that could be modified by training. Key concepts of continuity and association were borrowed intact from animal psychology and transferred to human beings. The paradigm excluded notions of culture, context, language production, internal action, and thinking (Becker, 1977). While current cognitive theories have gone a long way toward addressing some of these early exclusions, no one psychological theory of learning can account for learning that occurs because of one's membership in a

group. When the research focus is on a unit of one, the brain and social and cultural factors elude scholarly efforts.

1.4.5 Behaviorism and Humanism

Educational practice and research in the United States ultimately fell under the sway of behaviorism and subsequent psychological theories of learning. Yet Western European curriculum and educational research emerged in a predominantly humanistic vein. National debates and their resolutions in the academy during the 30s and the 40s can partially account for this difference. During the 30s, U.S. philosophers began to adopt theories proposed by certain analytic European philosophers, particularly those logical positivists in the Vienna Circle and, secondarily, British analytic linguists. Quine, who had studied briefly with these philosophers in Vienna, paved the way for the migration of Carnap, Reichenbach, Hempel, Neurath, and Feigl to Ivy League universities where they remained to escape Naziism. In opposition to the European humanist philosophical traditions that these men believed accommodated fascism, they called themselves "scientists," not humanists (Borradori, 1994). Their project set the trajectory for U.S. philosophy for decades to come and contributed to the valorization of those academic disciplines based on positivism, i.e., science and mathematics. Even the pragmatists James and Dewey were convinced by some logical positivist arguments and incorporated them in their later works. And Quine's analytic work was strongly influenced by Skinner, a close Harvard colleague of his (Borradori, 1994). Ultimately the postwar culture in the U.S. academy was mainly positivist and in certain disciplines behaviorist, while the Western European academy remained predominantly humanist. While not the sole influence on curriculum development, this U.S. culture shaped educational practices and, finally, the development of the educational technology field.

Although scholarly audiovisual texts in the late 20s and early 30s were exclusively behavioral, applied books of that period were not. Also in the late 30s, scholarly audiovisual books began to reflect the child-centered notions of Dewey and others. For a brief time (approximately the late 30s and 40s), humanist, child-centered discourses were ascendant in departments of education, in curricular practices, and in the emergent audiovisual field. This was not the case in the 20s or early 30s, nor later when the AV field acquired the title of "educational technology." But membership in DVI in the 30s was eclectic (artists, commercial and educational filmmakers, librarians, school administrators, government officials, teachers, etc.), which suggests that the discourse that dominated the practice of audiovisual instruction during this period was multivocal. Many late 30s and 40s texts merged theory and pedagogy because of the pragmatic nature of the dominant Deweyesque discourse.

But the fact that child-centered theories dominated the audiovisual and general educational discourses from the

mid30s was a short aberration, both in U.S. curricular practice and audiovisual scholarship. Each of the neobehaviorists writing in the 20s and 30s contributed to educational technology scholarship in the 40s and 50s. And each theorist trained World War II researchers. This means that World War II film researchers, most often selected from educational psychology departments that had been established on university campuses approximately in the mid20s, were steeped in a specific neobehavioral theory with its language, which included and excluded certain concepts. During World War II, they designed and executed experiments within a narrow psychological discourse, which was often well suited to the training taking place. The rigor we associate with the post-WW II period of educational technology research most likely came from the sophistication of measurements, and statistics for experimental and quasiexperimental designs, rather than from further articulation of behaviorism.

1.5 EARLY AUDIO VISUAL SCHOLARSHIP

1.5.1 Connectionism and Mental Measurement

Scholarly audiovisual texts written in the early 30s display a convergence of the compatible discourses of social efficiency and Thorndike's brand of psychology and mental measurement. This convergence, which can be traced in educational psychology as well as educational technology, remains with us today. Of concern to AV scholars in the 30s was the effectiveness of film in teaching school subjects, the proper application of films in the classroom, and the intellectual and emotional impact of commercial films on students.

15.1.1. University Press. One way of ascertaining the status of a new area of study in the academy is to note if university presses, which print primarily scholarly material, publish books on the new area. Three books published by prestigious university presses in the early 30s were *The Educational Talking Picture* (Devereux, 1933), *The Sound Mo-*

- V. Final Test Gains over Initial Test for Combined Cities
- VI. Final Test Gains on Picture-Unit Items for Combined Cities
- VII. Final Test Gains on Non-Picture Items for Combined Cities
- VIII. Final Test Gains over Initial Test for Groups of Below-and-Above-Average Intelligence Levels
- IX. Recall Test Gains over Initial Test for Combined Cities
- X. Recall Test Gains on Picture-Unit Items
- XI. Recall Test Gains on Non-Picture Items

Figure 1-1. List of Illustrations, results of experimentation from *The Educational Talking Picture*, by F. Devereux, 1933, Cambridge: Harvard University Press, xiii.

tion Picture (Rulon, 1933), and *Motion Pictures in Education in the United States* (Koon, 1934). These books begin to disclose what the founders of educational technology thought was knowledge important enough to be included in the field. The Devereux text (in the foreword, Robert Hutchins provides the text with an additional note of authority and a military connection when he refers to the author as "Colonel Devereux") and the Rulon textbook include reports of experiments with students and films. The language of the laboratory is employed, and strenuous efforts at objectivity are made. A list of the illustrations in the Devereux book and a list of the tables in the Rulon text will provide a picture of the depth of commitment to connectionism and mental measurements, even in the early 30s (see Fig. 1-1).

These lists indicate that the authors were following the lead of the few AV researchers who had preceded them in the 1920s. They were using experimental and control groups, and were controlling for some individual differences (students were not yet called subjects). They were measuring mean differences and were using standard IQ measures. In the light of today's more sophisticated statistics, the experiments were lacking. They did, for instance, measure the percent of mean difference and conclude that a film was X% better in teaching a subject than was standard teaching. But the base of a behavioral discourse complemented by specific mental measurements was there in its entirety. What was thought to be important were elements that could be isolated and controlled and, therefore, measured, i.e., intelligence and performance on immediate and delayed tests. Edgar Dale comments on the fact that the experimental model was de rigueur even in the 20s.

They employed Freeman, Frank Freeman of the University of Chicago and Ben Woods of Columbia University to make a study of audiovisual materials, films in this case. So they set up an experiment in the usual fashion (italics ours). They had control groups and experimental groups. They produced 20 films, 10 in general science and 10 in . . . general science and geography.... And plans were very carefully developed for the use of those materials.... Well, then they gave pretests and posttests. And speaking roughly, the youngsters having the films learned 15% more information than the ones that did not have it. Although it was a curious thing that happened. They let them (the schools) chose their own control groups. It turned out that the schools made the control groups typically brighter than the others. And this curious kind of reasoning (emerged), namely, because the control groups would not have the advantage of the film, so they ought to be just a little bit brighter and so on. Of course it's suspicious reasoning. That's what we're trying to test.... But they (the experimental groups) did better. And these (tests) would be simple information of what was in the film (Dale, 1977).

Early and late, the human factor confounded laboratory practices.

1. Census Data by Occupations
2. Geographical Distribution of Students
3. Teaching Load
4. Group Balancing Data
5. Geographical Distribution of Balanced Groups
6. Teaching Load in Balanced Groups
7. Immediate Test Group Results
8. Achievement Prediction Correlations
9. Immediate Group Comparisons
10. Immediate Percentage Comparisons
11. Immediate Percentage Comparison Standard Errors
12. Immediate Picture-Verbal Results
13. Immediate Text-Film Results
14. Immediate Rote-Education Results
15. Retention Group-Balancing Data
16. Retention Group Comparisons
17. Immediate-Retention Differences
18. Retention Percentage Comparisons
19. Retention Picture-Verbal Results
20. Retention Text-Film Results
21. Retention Rote-Education Results

Figure 1-2. List of Tables, from *The Sound Motion Picture*, by J. Rulon, 1933, Cambridge: Harvard University Press, xiii.

1.5.2 A Small Circle of Friends

Another way to discover the theoretical underpinnings of researchers is to note the resources included in their texts. In his bibliography, Rulon leans heavily on the audiovisual experiments of Freeman (1922, 1924) in the 20s, the behaviorism of Hull (1928), the experimental work of Knowlton and Ellton (1929), and McClusky (1924). (See Fig. 1-2.)

Other scholars often cited were J. J. Weber (who spanned the 20s and 30s), H. Wise (1939), L. Westfall (1937), V. Arnspiger (1937), and F. Consitt (Dale, p. 400). Weber's work compared silent film, slides, and diagrams as modes of instruction, while Westfall examined pupil interest and IQ in relation to film. Arnspiger, who later became director of educational research for Educational Research Pictures Incorporated (ERPI), explored retention of information after film screening and the type of information best suited to film, while Consitt wrote about grade-level differences for film

learning and subject matter suited to film. Wise experimented with film for the teaching of history. Their research followed the lead of AV studies of the 20s and was built on a behavioral or connectionist base while employing mental measurements. The subject matter and rhetoric of their reports generally follow the topics and style of the texts reported above.

Like interlocking boards of directors, the names of a small group of AV experimental researchers from the late teens and 20s appear extensively in the literature of the 30s and even the 40s. They are Sumstine (1918), Lacy (1919), Weber (1922) and his pioneer study with 500 New York seventh-graders, Freeman (1924) and his large study at the University of Chicago, Knowlton and Tilton (1929) at Yale and their work with the *Yale Chronicles of America*, Freeman's joint project with Ben Wood at Columbia University (Wood & Freeman, 1929), and McClusky (1924) who became director of the Department of Visual Instruction of the National Education Association.

Media in the 20s and 30s classroom was certainly not restricted to sound films, however. James Brown tells us:

Well (we used) the famous Keystone 600 set for example in the social studies, which was a set of 600 3 1/4-by4- inch black-and-white slides done by the Keystone Company in Meadville, Pennsylvania. [it] was one of the tools that we used. We had mostly silent films when I started, 16-mm silent films, that seems a long time ago.... They usually had captions in those days. Following the precepts of how you teach with a silent film-and I still think silent films have a great deal to offer in this regard-we would generally stop and start the film throughout; and stop and discuss or put it on hold for a still picture on the screen, even though it was a motion picture.... So you could do that and teach from the pictures (Brown, n.d.).

1.5.3 Film Usage in the 1930s

Research reports were not the only topics of scholarly audiovisual texts of the 1930s. Two (Koon & Devereux) of the three scholarly AV books (Koon, Devereux & Rulon) published by University Presses in the early 30s and cited above include discussions of subjects other than experiments. To introduce these topics, we include selections from their tables of contents.

1.5.4 Programs for Administration

The administration of audiovisual aids in schools and the utilization of these aids in classrooms was an important, almost dominant, aspect of general and some scholarly AV texts in the 30s. Whereas today, a university press or academic journal, such as *Educational Technology Research and Development*, would be reluctant to publish "how to" articles about technology, such was not the case in the early 30s. While all the scholarly texts we examined from that time did base their recommendations for film usage on experimentation, they also provided school-, district-, and state-

wide guidelines for administering AV programs; tips for screening films in the classroom; criteria for selection of films; and sometimes directions for local production of films. These topics were a vital aspect of a burgeoning field, since most educators had little or no knowledge of the application of films in the classroom. Because no rhetoric is neutral, language of administration and utilization of AV materials needs to be examined briefly.

Devereux elevates the pragmatic tasks of utilization and production by including them in a research agenda for the field in a chart (see Fig. 1-3).

Although Devereux's chart for film research appeared in 1933, it is similar to many later instructional development charts for either programmatic research in the field of design and development of curricular or training materials. A couple of decades later, systems theory appears in the educational technology literature. Springing from the human engineering field and the military, systems literature is replete with charts that partition and categorize concepts and tasks. Devereux had been a colonel in the Army and an executive for the American Telephone and Telegraph Company for many years (Saettler, 1990). When his book was published, he was vice president of Electrical Research Products Inc. (ERPI), a nontheatrical film production company that was a subsidiary of AT&T. Clearly, he had knowledge of administrative practices in the military and corporate sectors. This crossbreeding is not trivial when one attempts to understand the emergence of this technological field, and we will return to this point later. Briefly, we find no other educational field, or many early academic fields, so tied to machines and technology and, therefore, market economics.

I. A New Force in Education
II. Organizing Talking-Picture Materials
III. Translating Instructional Materials into Talking Films
IV. Standards of Excellence
V. Appraisal of the Educational Talking Picture
VI. Suggested Fields for Future Research in Educational Talking Pictures
VII. Utilizing the Educational Talking Picture on the Elementary- and the Secondary-School Levels
VIII. Administering a Local Program of AudioVisual Instruction
IX. Use of Educational Talking Pictures on the College and University Level
X. Utilization of the Educational Talking Picture on the Adult Level
XI. School-Building Requirements for AudioVisual Instruction
XII. Types of Equipment and Standards for their Selection

Figure 1-3. Tables of contents from *The Educational Talking Picture*, by F. Devereux, 1933, Cambridge: Harvard University Press, ix.

VII. The Technique of Making and Displaying Motion Pictures.

- A. The Production of Educational Films
- B. The Projection of Educational Films

VIII. The Systematic Introduction of Motion Pictures in Teaching

- A. The Value of Visual Aids in Instruction
- B. The Extent of the Use of Motion Pictures in Teaching
- C. Reasons for Failure to Use More Motion Pictures in Schools
- D. More School Use of Films Probable
- E. Some Essentials in Introducing Films in Teaching

IX. Educational Problems of a General Nature Resulting from the Systematic Introduction of Motion Pictures in Teaching

- A. Methodology of the Use of Motion Pictures in Schools
- B. Comparison of the Effectiveness of Films and Other Didactic Auxiliaries
- C. Subjects in Which Films Could Be Used as an Auxiliary in Accordance with the Curricula
- D. Collaboration of Experts in the Production of Didactic Films
- E. Psychological Effects and Pedagogical Reform in Connection with the Film in Schools
- F. The Efficacy of the Intervention of the State in the Solution of the Systematic Introduction of Cinematography in Schools

X. General Conclusions

- A. The Theatrical Motion Picture Has Become a Powerful Force in National Life.
- B. Nontheatrical Uses of Motion Pictures are Varied.

Figure 1-4. Table of contents from *Motion Pictures in Education in the United States*, by C. Koon, 1934, Chicago: University of Chicago Press, xiv.

1.5.5 Administration and Social Efficiency

When addressing administration of audiovisual programs, the authors of these texts (Koon & Devereux) invoke the vernacular of the social efficiency movement. In the first five pages of his text, Devereux (1934) uses some form of effective six times: “to increase the effectiveness of the process” (p. 1), “any effective use of the talking picture” (p. 2), “effective educational talking pictures,” and “the working

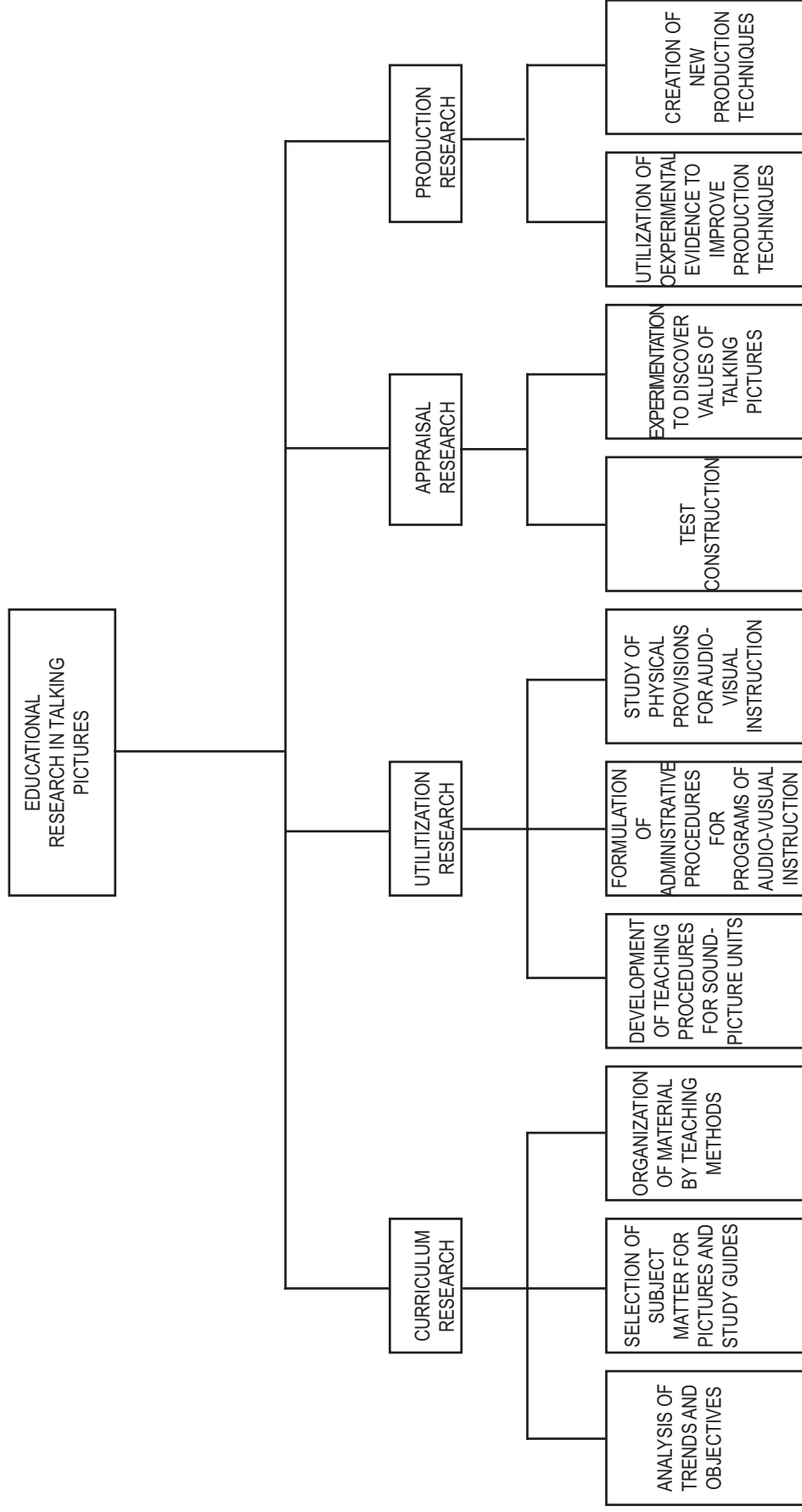


Figure 1-5. Major research functions in developing the educational talking-picture program, Deureux, 1933, p. 4..

effectiveness of various elements of film” (p. 3), “depends upon effective utilization” (p. 5).

In a chapter entitled *The Systematic Introduction of Motion Pictures in Teaching*, Koon (1933) uses the following language “. . . a real need for improved methods of instruction, particularly the use of media which will furnish meaningful content to the school curriculum” (p. 57). Experiments, he claims, have shown that media “increases initial learning, effects an economy of time in learning, increases permanence of learning, aids in teaching backward children and motivates learning” (p.57) [Italics ours.] (It should be noted that many authors writing in the 20s and 30s considered backward children to be a prime audience for audiovisual aids.) Koon was the senior specialist in radio and visual education, U.S. Department of the Interior, and was another researcher naturally concerned with the administrative aspects of these programs. Speaking with the authority of the federal government and as a representative of corporate America, Koon and Devereux were invited to publish scholarship at university presses, although each author had collaborators who were university faculty. That their voices reflect the popular social efficiency movement of the day is not unusual. One of the lynchpins, however, of social efficiency is social control, and this effect surfaces obviously in Koon, and again in a more latent fashion in Devereux and Rulon when they use IQ and other tests to “isolate and control” differences.

Koon’s (1933) subheadings in a chapter on problems with introduction of film in teaching are shown in Figure 1-6.

What is of interest here is another aspect of the language of social efficiency. Federal aid to education had not yet started in the 30s, but interest in some level of systematic governmental intervention was an issue for Koon.

1.5.6 Authors’ Interests

Part of discourse analysis is the examination of author intention, and prefaces and forwards provide clues to reasons why writers have produced texts, disclose the authority with which they speak, and the manner in which they position their readers. Prefaces and forewords in Rulon (1933, pp. iix-xi), Devereux (1933, pp. v-vii) and Koon (1934, pp. v-xi) texts are rich sites for such examination. Some of the introductory comments of these books are written in a different style. The language of one (Rulon, 1933) remains terse, unelaborated, and scientific in style, but the other two display a different voice, one not heard in the body of the texts. The Koon (1934) foreword is somewhat literary, containing figures of speech such as “Let who will make my country’s laws, so long as I may write her songs . . .” (p. v), and “. . . that is entertained and informed by this magical master teacher . . .” (p. v), “. . . but these are kaleidoscope times” (p.vi), and “As we approach the dawn of a new day in industrial life . . .” (p. vi). It is a rhetoric that runs counter to the unelaborated “scientific” language that academic research-

ers strove for then and now, but its voice breaks through the opening statements of these early texts and others in the 30s and 40s, despite the authors’ attempts to control this voice, to be objective. However, the voice of objectivity, terse and scientific, efficient in its style, appears in these opening segments and is coexistent with an elaborated voice. In other AV texts of the 30s that are expositions or summaries and published by presses other than university presses, this conflated voice runs rampant in the discourses and uncovers some of the motives of the founders of the field. (As 1990s scholars in the field, we find it refreshing to hear this voice.

- | |
|---|
| <ul style="list-style-type: none">A. Methodology of the Use of Motion Pictures in SchoolsB. Comparison of the Effectiveness of Films and Other Didactic AuxiliariesC. Subjects in Which Films Could Be Used as an Auxiliary in Accordance with the CurriculaD. Collaboration of Experts in the Production of Didactic FilmsE. Psychological Effects and Pedagogical Reform in Connection with the Film in SchoolsE. The Efficacy of the Intervention of the State in the Solution of the Systematic Introduction of Cinematography |
|---|

Figure 1-6. Chapter subheadings from *Motion Pictures in Education in the United States*, by C. Koon, 1934, Chicago: University of Chicago Press, xiv.

1.5.6.1. Conflated Voice. Our thesis about the appearance of this conflated voice is that many discourses were conjoined in the turbulent 30s. Even though the early AV authors were highly influenced by the social efficiency movement in the schools and behavioral methods of research, they had been trained to write in public schools in the teens and 20s. Composition instruction, at that time, relied heavily on literary techniques. Whether students were writing narratives or expositions, they were taught to describe their plots or advance their arguments by employing figures of speech and by alluding to classical writings. Thirties AV writers had learned their expository rhetoric well, and their texts seek primarily to convince an audience of a point of view. They state their argument, provide proof, and summarize their points.

1.5.6.2. Technology as Progress. Methods of proof, however, do disclose a primary allegiance to social efficiency and behaviorism and adopt the language of those discourses. Nonetheless, persuasive techniques in an elaborated language seek to convince the reader of the goodness of technology for society and more specifically of the value of films in public classrooms. Indeed, the authors often become rhapsodic about this value.

Louis Forsdale’s comment is typical of this stance:

. . . one other thing that we also believed to be true was that if the moving image was indeed accessible to everybody-child, teacher, housewife, anybody-that it would then come closer to the role that the book has played (Forsdale, 1979).

If there is an underlying assumption that coalesces these early voices it is that technology is progress; technology is an ameliorative force in society. If some of the founders had private fears about the proliferation of technology, it rarely entered their public discourse. Within our texts, we found only one note of caution:

We must be careful to avoid . . . one of the gravest dangers of the audiovisual field: the notion that the mere bringing of people physically and sensorially into contact with objects and materials always offers a communication of experience (Dale, 1977).

Floyde Brooker (1975) mentioned public concern, not about the cognitive nor moral effects of the films but about health:

One of the great fears of the public at that time was that the children seeing motion pictures in a dark room would injure their eyes.... Eastman Kodak ... they had tinted all their films a deep amber color, in order to prevent injury to the eyes. And all the people on the panels that were seeing the Teaching Film Custodian films had their eyes examined by a battery of ophthalmologists every week to make sure that their eyes were not being damaged by seeing so many motion pictures. And this was used throughout the educational journals of the time to give proof to the fact that seeing motion pictures was not injurious to the eyes of children (Brooker, 1975).

Although they were concerned with the appropriate projection of films in the classroom, and proper AV administration in schools and districts, those issues were primarily mechanistic. Founders' concerns about the criteria for selection of films mainly addressed the learning gains to be obtained from the screening of any one film. Where some of these authors did express concern about the proliferation of films and the effect on children, it was in relationship to students' exposure to Hollywood film. A modicum of that concern spilled over into the classroom; for example, see *Motion Pictures in Education: A Summary of the Literature: Source Book for Teachers and Administrators*, by Edgar Dale, Fannie W. Dunn, Charles F. Hoban, and Etta Schneider (1937). It is not unusual in the history of technology for discrete discourses about the social effects of mechanization to develop from the love-hate positions that people assume vis-à-vis machines (Benjamin, 1968; Nichols, 1981), but the cautious position is not present in the written or oral texts we examined. A general enthusiasm for technology in the classroom permeated the public texts. It was one spoken value that partially unified the audiovisual project and probably accounts, in large measure, for the success in establishing the field.

1.6 TECHNOLOGY AND PSYCHOLOGY: EARLY AUDIOVISUAL SCHOLARSHIP

That the audiovisual scholars of the 20s and most of the 30s followed prevalent theoretical and methodological trends in educational psychology was a key step in the establishment of the field. The coin of the realm in the academy at this time was connectionism (behaviorism after Hull), mental measurements, and aspects of social efficiency. It was smart for these scholars to secure a berth for AV education by conducting psychological research. We are not suggesting that these were studied, deliberate moves on the part of AV scholars. Many of them were in and of the academy, and the culture of departments of education, especially in the 20s, was behavioral and experimental. We are also not suggesting that this culture did not gain academic status for departments of education, a status from which we still benefit. We do not contest the idea that before Thorndike, educational research in the United States was a helter-skelter affair.

We do suggest that connectionism, mental measurements, and social efficiency defined the dominant discourse in educational inquiry at a moment in time when the audiovisual field was emerging. We suggest that educational technology scholars have inherited a legacy, both fortunate and unfortunate. To start a field with the notion of the mind as a *tabula rasa* is unfortunate, because it is a concept ripe for imprinting and control. To trust that mental measurements are neutral and do not spring, originally, from a desire for control is naive. This issue was central for Thorndike and has been revisited recently by scholars such as Foucault (1977) and Curtis (1993), among others. Thorndike noted:

The science of education can and will itself contribute abundantly to psychology. Not only do the laws derived by psychology from simple, specially arranged experiments help us to interpret and control mental action under the conditions of schoolroom life. Schoolroom life itself is a vast laboratory in which are made thousands of experiments of the utmost interest to "pure" psychology (Thorndike, 1910).

1.6.1 Residuals

Practically speaking, the fields of educational psychology and technology have suffered from the limits imposed by either behavioral or richer theories of the mind subsumed under cognitivism. Limitations imposed by the study of a unit of one, the brain, in a social setting have taken a toll on both fields. This toll can best be described by the inordinate focus of scholars from these fields, for practically 3 decades, on minuscule instructional problems. The psychological models available to us, and their concomitant statistics, demanded study of microaspects of learning and instruction. (Some of this may be partially redressed in educational psychology by the appearance of constructivism.) But what has the study of microaspects of learning contributed to the field of educational technology as a whole? When we compare experiments of the 20s with those of the 60s or 70s, we note

similarities, a proliferation of nonconnected, nonprogrammable microstudies. What is different about the later studies and concerned many graduate students was appropriate statistical application, not how to formulate more relevant research questions. How can we account for what educational technology has taught us through the years?

The current shift of power in the academy away from educational psychologists may be partially explained by their lack of ability to address macro-problems of learning, in this period of national dissatisfaction with the enterprise of public schooling.

1.6.2 General Audiovisual Texts

In addition to scholarly texts of the early 30s, many general audiovisual texts were published. Two texts were widely circulated. They are *Visual Instruction, Its Value and Its Needs* (McClusky, 1932) and *Motion Pictures in Education: A Summary of the Literature: Source Book for Teachers and Administrators* (Dale et al., 1937). F. Dean McClusky had been a student of Frank Freeman's at the University of Chicago, but carved a career for himself, not as a scholar but as an administrator. In fact, he became an authority within the AV economic realm who was devoted to the advance of machines in the classroom. In the 20s he had conducted the Freeman Commonwealth Studies at the University of Chicago under the direction of Frank Freeman (Saettler, 1990) and written about the administration of AV programs and the preparation of teachers. His 1932 text is a summation of that work. Although he wrote articles and reports from the 20s until 1950, in keeping with the analysis here, we focus on his book *Visual Instruction, Its Value and Its Needs* (McClusky, 1932). Since his concerns were broad, his studies were surveys rather than experiments, and his style is not scientific. Structured survey research was in its infancy and was a method suited to claims for diffusion of innovation. He employs economic language such as supply and demand, profit, service motive, commercial efforts, competition, etc. (McClusky, 1932). In his book, he mixes economic arguments that were present in the oral vernacular of the early field but become central to general discussions in books such as McClusky's and administrative texts. McClusky has a delightful way of mixing professional esprit that we found so prevalent in the oral histories and sound administrative and economic advice about the field. (We looked forward to listening to Dr. McClusky's audiotape, but it was unclear.) This marketplace discourse, while not foreign to his audiovisual contemporaries, is prevalent in McClusky. His clear language and friendly authority were instrumental in starting the field.

Although not a textbook in the normal sense, *Motion Pictures in Education: A Summary of the Literature: Source Book for Teachers and Administrators* is written as a learning tool for researchers, teachers, and school administrators (the assumed students of visual instruction and educational motion pictures). It is a book consisting of six parts, each by

a different author(s). Composed of annotated bibliographies of educational journal articles, books, and theses devoted to visual education from the mid-1920s through the mid-1930s, the text is arranged according to subject areas (administration of visual aids, teaching with visual aids- especially the motion picture, instructional materials selection, school film production, instructional films experimental research, and visual education teacher preparation). The authors summarize those materials they feel are most useful to their readers but do not evaluate these items. In addition, the authors assist their readers by adding editorial comments. Their hope is ". . . that this volume will acquaint the reader with the significant literature in the field, and will present information necessary to those who wish to be intelligent about the contribution of the motion picture to education" (Dale et al. 1937, p. 12).

1.7 NEW DISCURSIVE TERRAIN: A SUMMARY

In the 30s, multiple voices spoke for the nascent audiovisual field in the academy. A nexus of varied but complementary discourses represented the new field of study. In this section, we have described some of these voices, and others have been uncovered in our extensive background reading. A story begins to emerge about the unique discursive terrain that was to become the academic field of educational technology. We will start to relate it here and unfold the rhetorical strands as they develop.

1.7.1 Machine Driven

No singular new or old discourse embodies the audiovisual field in the 1930s, although the appearance of this area is contingent on similar interests expressed in varied rhetoric. We have attempted to illustrate how similar values inherent in social efficiency, mental measurements, animal psychology, and educational psychology informed the scholarly audiovisual conversation. But educational technology was not educational psychology; they grew separately in the academy, and the convergence of similar discourses is not sufficient to describe the unique nature of educational technology. Despite efforts of some academics to deny it, this field is machine and market driven (see 37.1.4). A vision of the field arose with the invention of machines that could teach masses of citizens. This is undeniable when one examines the tables of contents of scholarly books from the 20s and 30s. It is an unescapable theme in the oral histories of the founders. We suggest that the frequent antitechnological values of the academy have tended to encourage educational technology scholars to deny their mechanistic origins and current status. (What better proof of this current status do we have than the issue of machines in public classrooms? Who influences decisions regarding educational technology in today's classrooms? We believe it is producers and distributors of hardware and software rather than educational technology professors.) This was the first educational field

in the 30s to be based on the presence of hardware and one of very few, i.e., engineering, in the academy at large. Current academic research functions in numerous modern departments at the whim of technology. But for the 30s, the formation of a discursive space around machines, universities, and the enterprise of public education was unique. The terrain was historically related to industry not schooling.

1.7.2 Schools, Government, and Corporations

Early in this century, military and nonmilitary members of the federal government recognized the power of certain communication technologies to educate masses of citizens, young and old alike. Governmental alliance with audiovisual educators occurred well before official congressional aid was allotted to national public schools. The reason for this alliance, we believe, was the recognition by both academic and governmental officials of the power of radio and film to communicate mass messages. (In this chapter, we have mentioned some of the military and nonmilitary positions of early audiovisual scholars, but Saettler [1990] describes all of their positions.) This alliance was not a cabal as some critics would describe it. It was a convergence of interests and desires expressed in similar rhetoric. In the scholarly texts we have examined governmental and educational rhetoric converge loosely aligning the separate discourses and allowing educational language to take precedence.

Governmental interest in the outcome of audiovisual research, because of the presence of mass media, was not the only influence on the establishment of new discursive space in the academy. Private and corporate entrepreneurs were naturally interested in the market fallout from inventions of Edison and Marconi. A massive capital drive in the early part of the 20th century, around the production and distribution of machines, made the U.S. a leading world power. An offshoot of that venture was business investment in education, especially educational machines. As the field coalesced in the 20s and 30s, this tie with the marketplace became evident in the positions held by leading audiovisual scholars. (Again, we have mentioned some of them in this chapter, but Saettler [1990] gives a fuller account of the corporate contacts of AV scholars.) The language and values of the marketplace are evident in the earliest scholarly texts and continue throughout the period we have studied.

While this phenomenon may not be unusual in schools of education or public classrooms today, it was novel in the 1930s.

What is unique about the 1930s audiovisual studies in the academy is the discursive juncture of educational, governmental, and market interests. Again, we stress the manner in which this was formed. The language from two discourses outside of education was adopted by founders who held positions in and outside of education. And educational rhetoric was always ascendant. This new discursive terrain

appears at least 2 1/2 decades before Eisenhower recommends a similar troika of government, education, and industry. (Because we have studied audiovisual texts over several decades, we note the continuance of this informal coalition.) As we continue, we will try to illustrate the manner in which the new and complex discursive plane was articulated in the later academic field, but first a few caveats.

As readers, you position yourselves within certain discourses; we believe it is impossible for you to do otherwise. You may value or repudiate the loose and informal alliance of business, government, and educational technology and its dependence on machines. We would like to stress that we believe the educational technology field originated and exists because of this juncture. In the academy, the founders could not have done otherwise: There was little initial support for machines, and had they not sought outside help we would have become a branch of educational psychology. We applaud the perspicacity of the founders in helping to establish this troika and, consequently, this field. There would have been no platform in the academy for views for or against educational machines unless the founders had forged this alliance. After all, they could have established a research and development arena in the corporate world and bypassed the niceties of academic freedom. And we, as authors, would not occupy the positions of privilege we have to recount history.

1.8 SHIFTING DISCOURSES

1.8.1 Edgar Dale

Edgar Dale, whose output spans the 30s to the 60s, was an influential leader and researcher, and his work is considered separately here, because it contains a specific learning discourse absent in the early experimental and administrative audiovisual literature. In fact, his turn away from experimentation and toward experience influenced most of the school-related audiovisual texts published in the 40s. Working as a researcher on the Payne Fund Studies, Dale published *How to Appreciate Motion Pictures* in 1933. His next publication was *Motion Pictures in Education* (1937). The language of his most influential text, *Audiovisual Methods in Teaching* (Dale, 1946), provides clues to his pragmatic discourse. In Dale's (1946) index, we note the appearance of entries that were unusual for the scholarly audiovisual arena. He includes an entry on chautauquas (p. 533) and one on direct experience (p. 534) that includes 51 pages of discussion on the topic. Unlike other AV researchers, he cites Dewey liberally (p. 534), includes Froebel (p. 536), William James (p. 537), and Johann Pestalozzi (p. 540), all humanistic educational theorists. In checking the references to these compatible authors in the body of the text, we found evidence that Dale incorporated their thinking to establish his theory of audiovisual education. Absent are entries on behaviorism, or mention of Thomdike, Hull, Guthrie, or Skinner; and the term efficiency is not evident in the book. What is evident is

that Dale based his concepts of learning from media on humanistic and developmental theories, especially Dewey's pragmatic notion of experience and education. But Dale leans as well on educators who influenced Dewey, namely, Froebel and Pestalozzi. To distinguish his child-centered theory from behavioral theories of learning he reclaims the word laboratory. "You have seen the word laboratory widely discussed in books and articles on education. We talk of the community as a laboratory for learning" (Dale, 1946, p. 76). Dale accepts Dewey's working definition of the mind as "the power to understand things in terms of the use made of them" (Dale, 1946, p.76). Laboratories, therefore, whether they are workrooms or field trips, allow students to pose their own questions, to explore, to see how things work, and to participate in direct experiential activity. For Dale, a learning theory was pragmatic, as it was for William James and John Dewey, and had to be based on experience.

The fact that child-centered theories enjoyed popularity in 1940s audiovisual texts is due, in large part, to Dale's influence. Note how a portion of his table of contents for *Audio-Visual Methods in Teaching* is drastically different from those we note from the early 30s (see Fig. 1-7).

Again, what tables of contents indicate is just what topics the founders deemed important enough to be included in the field, and their order indicates how they might wish the field to be organized. The topics Dale includes, which had been excluded from earlier audiovisual scholarly texts, are many aspects of experience, discussion of permanent learning, concept building, the new notion of a laboratory, dramatic participation, field trips, museums, etc.

Although Dale published from the 1930s until the 1960s, we have selected this text because it represents a theoretical summation point for him. Although he continued his inquiry into one pragmatic approach to education, his discourse was overshadowed after World War II by the reappearance of a behavioral rubric.

When Dale was asked why he did not do experimental research in which a scholar attempted to prove over and over that students learned from radio or film, he replied:

It always bothers me, because anybody knows that we learn from these things (media). There's no issue about that . . . Well I suppose in any field, to be respectable you have to have a certain kind of research (Dale,1977).

1.9 EDUCATIONAL TRENDS IN THE 40s

Scholarly texts about audiovisual aids in the schools were published primarily in the early 40s, between 1940 and 1942, and in the later 40s, in fact, mainly in 1949. Audiovisual scholars were caught up in the war effort and most were involved with military training. In the schools, however, curriculum was shifting. Arguments mounted in the 30s about the inadequacy of schools, and the necessity for drastic reform changed with the growing sense of patriotism that permeated

U.S. institutions during World War II. Efforts to include students in the war drive became an official part of the U.S. curriculum and were operationalized in school-sponsored scrapmetal collections, bond drives, and encouragement for victory gardens. Oftentimes, reading groups were divided into platoons with sergeants and colonels as leaders. The language of WW II permeated formal and informal classroom activities (Tuttle, 1993).

1.9.1 Life Adjustment Curriculum

Curriculum design in the 40s was also altered. Kliebard (1990) points out that in times of worker shortages, consumer education must be stressed. Vocational education and courses such as physics and mathematics were restructured to place "greater stress on aeromechanics, aeronautics, auto mechanics, navigation, gunnery, and other aspects of modern warfare" (Smith, 1942). The original Smith article written for *Curriculum Journal* was "The War and the Educational Program." Leading educators were co-opting military rhetoric for classroom purposes. Vocational education was designed to stress preparation for manual labor as well as white-collar jobs, which it had encompassed to date, and the 40s became an era of adjusting the curriculum to more closely entail the life activities of U.S. citizens. Generally, this was known as the life adjustment curriculum (Kliebard, 1987). Its proponents built on the work of certain social efficiency proponents of the 30s who had generated long, detailed lists of job activities to be taught in the schools. (W. W. Charters was the most prominent among them.) But proponents were more directly influenced by the publication *What High Schools Ought to Teach* (Tyler, 1940). A functional, work-oriented curriculum was proposed in this 1940 report of the 8-year high school study directed by Ralph Tyler. Although Tyler eschewed the traditional curriculum and control of the secondary curriculum by college entry requirements, his recommendation for "life adjustment" study is informed by his theoretical assumptions. As early as 1931, he stated that it was crucial to define clearly the types of behavior that needed to be taught (Kleibard, 1987, p. 215). The recommendations of this report were couched in early Tyler rhetoric (Kleibard, 1987, p. 220), foreshadowing the Tyler rationale that shaped many years of curriculum and instructional practice. The formal response to this report occurred in 1945 when the Prosser resolution was passed in the U.S. Congress. It formalized the life adjustment curriculum and provided the first massive federal funding for public education. By the 1950s, the life adjustment curriculum was well entrenched in the schools (Becker, 1990). Edgar Dale remembers talking to Tyler about what part of his work was most important to him.

Finally, about 6 months ago, I asked Ralph Tyler in terms of his career, what did he think stood out (as) the most fruitful, and so, he said "the 8-year study." And what the 8-year study did was loosen up the high school curriculum, make it easier for persons who had different curricula to get into col

PART I: THEORY OF AUDIO-VISUAL MATERIALS

1. VISUAL AND AUDITORY MATERIALS IN TEACHING, 2
 - Good Teaching, 2
 - Some Cautions, 6
 - Some Questions to Think About, 7
 2. EDUCATION FOR "PERMANENT" LEARNING, 8
 - Why Pupils Forget, 8
 - Effective Learning, 12
 - Verbalism, 16
 - What Is a Rich Experience?, 19
 - Summary, 22
 - Some Questions to Think About, 23
 3. MAKING EXPERIENCES USABLE, 24
 - Building Experiences Through Generalizing, 28
 - Concepts in Arithmetic, 29
 - Concepts in Geography, 31
 - Concepts in Grammar, 32
 - Education Involves Concept-Building, 32
 - Summary, 35
 - Some Problems to Think About, 36
 4. THE "CONE OF EXPERIENCE," 37
 - Direct, Purposeful Experience, 38
 - Contrived Experiences, 38
 - Dramatic Participation, 41
 - Demonstrations, 42
 - Field Trips, 42
 - Exhibits, 43
 - Motion Pictures, 44
 - Still Pictures, Radio, Recordings, 45
 - Visual Symbols: Charts, Graphs, Maps, etc., 45
 - Verbal Symbols, 46
 - What the Cone Is and Is Not, 47
 - Summary, 51
 - Some Problems to Think About, 52
 5. MOVING FORWARD BY LOOKING BACKWARD, 53
 - Introduction, 53
 - Some Attempts to Make Education Realistic, 56
 - Summary, 62
 - Some Questions to Think About, 62
 - PROBLEMS IN AUDIO-VISUAL INSTRUCTION, 63
- ## **PART II: AUDIO-VISUAL TEACHING MATERIALS**
1. DIRECT, PURPOSEFUL EXPERIENCE, 68
 - Examples of Direct, Purposeful Experience, 69
 - Direct and Indirect Experience Compared, 73
 - The Laboratory Idea, 76
 - A Word of Caution, 77
 - Experience as Organic, 78
 - Some Questions to Think About, 80
 2. CONTRIVED EXPERIENCES: MODELS, MOCK-UPS, 82
 - What Is a Contrived Experience?, 84
 - Model and Mock-Up Differentiated, 87
 - What the War Experience Revealed, 88
 - The Globe as a Working Model, 90
 - The Planetarium, 91
 - Making Terrain Models, 92
 - Exact-Scale Models, 93
 - Cut-away Models, 94
 - Simplified Models, 95
 - Objects and Specimens, 97
 - Some General Observations, 98
 - Some Questions to Think About, 100
 3. DRAMATIC PARTICIPATION, 101
 - Values of Dramatization, 103
 - Kinds of Dramatization, 105
 - The Puppet Show, 109
 - Using Plays in the Classroom, 112
 - Dramatization: Some Applications, 114
 - What About Costume?, 117
 - Drama, Theater, and Education, 118
 - Some Questions to Think About, 120
 4. DEMONSTRATIONS, 121
 - Introduction, 121
 - The Underwriter's Knot, 123
 - Key Points, 124
 - Improving Your Demonstrations, 125
 - "Things to Watch for," 130
 - Some Problems to Think About, 132
 5. FIELD TRIPS, 133
 - Educational Theory of Field Trips, 136
 - A Field Trip May Influence Attitudes, 137
 - The Field Trip and the Community School, 137
 - Field Trips Must Be Planned, 139
 - How Would a Specific Field Trip Be Carried Out?, 143
 - "Trip to the Cleveland Flats," 145
 - The Follow-Through, 150
 - Some Field-Trip Difficulties, 151
 - A Checklist for Teachers, 155
 6. EXHIBITS AND MUSEUMS, 157
 - General Purposes of Exhibits, 158
 - Loan Exhibits, 160
 - School-Made Exhibits, 164
 - Some Examples with Comments, 167
 - Some Standards for Exhibits, 168
 - Public Museums for Teaching, 170
 - Museums for Classroom Subject-Matter, 174
 - The School Museum, 180
 - Questions and Problems to Think About, 181
 7. MOTION PICTURES: EDUCATIONAL AND DOCUMENTARY, 182
 - The Specific Values of Motion Pictures, 183
 - Danger Points in the Use of Films, 191
 - Using the Motion Picture Intelligently, 195
 - The Story of Dr. Jenner, 197
 - The Documentary Film, 199
 - Some Questions to Think About, 203

Figure 1-7. Table of contents from *Audio-Visual Methods in Teaching*, by E. Dale, 1946, New York: The Dryden Press, xi-xiii.

lege, and so on.... I think the most striking conclusion (of the 8-year study) was that the schools that had the most innovation had done the best in terms of school work. The greater the innovation, the greater the productivity of the school (Dale, 1977).

For a detailed description and assessment of the 8-year study, please see *The Struggle for the American Curriculum* (Kleibard, 1987).

1.9.2 Nonmilitary Audiovisual Scholarship of the 40s

Experimental research occurred under the auspices of the military in the 40s and deserves a separate examination, but scholarly texts of the decade were focused on application, not experimental studies. Although the social efficiency education proponents were gaining a foothold in public school curriculum through the emphases on vocational education and ‘job activities’ lists, a humanistic educational discourse was ascendant. Classroom practices were complex, mixing child development, Deweyesque assumptions about learning with the ‘project method’ from social efficiency proponents. Both camps wanted activities for the children, but for different ends and with different assumptions. Even though audiovisual writers concerned with schools were primarily influenced by the experiential childcentered camp, they mixed project and task analysis with their discussions. By and large, practical life experiences served as a basis for designing curriculum that would incorporate AV materials. The emphasis on vocational education, especially blue-collar jobs, gave the AV field an unexpected boost. Instead of following the Charters lead, however, and allowing curriculum developers to draw up lists of learning activities, most AV educators of the period went to teachers and students and attempted to decipher childhood experience and learning.

1.9.3 American Council on Education

Influential audiovisual texts from the American Council on Education (ACE) were published in the 40s, although research for the texts was conducted in the 30s. Both Paul Saettler and Floyd Brooker comment on their importance:

Probably the most significant project in educational technology during the 1930s was the Motion Picture Project of the ACE. This project generated insights and theories of instruction that led to instructional techniques that almost totally determined the pattern for the instructional programs of the U.S. Office of Education and the armed forces during World War II (Saettler, 1990, p.230).

And Brooker agreed:

Another final thing which I don’t want to overlook, and which none of us anticipated, was that the Motion Picture Project of the American Council on Education became unwittingly a primary tool for the training of personnel for the tremendous advance of films in the war effort of the

United States government (Brooker, 1975).

The Committee on Motion Pictures in Education, which was a branch of the ACE, conducted a 5-year study entitled *The Motion Picture Project*. The impetus for this enterprise came from opposite directions. Some American educators and governmental officials were interested in harnessing theatrical films for use in the classroom, while opponents to Hollywood were worried about the influence of cinema on the emotional lives of students. The Payne Fund Studies (1929-32) had created these discursive dichotomies, and the Motion Picture Project was partially undertaken to respond to Payne’s study findings. Note Charters’ rhetoric as he reports the Payne findings:

The motion picture, as such, is a potent medium of education.... Emotions are measurably stirred as the scenes of a drama unfold, and this excitement may be recorded in deviations from the norm in sleep patterns, by visible gross evidences of bodily movement and by refined internal responses. They constitute patterns of conduct in daydreaming, phantasy [sic] and action. Second, for children the content of current pictures is not good. There is too much sex and crime and love for a balanced diet for children. Third, the motion picture situation is very complicated. It is one among many influences which mold the experience of children (Charters quoted in Saettler, 1990, p. 229).

This was strangely inflammatory language for Charters, who was (or became?) a proponent of the use of films in the classroom. We speculate that it helped crystallize positions around the benefits or danger of films in schools. A crystallized stance is obvious in one anecdote recounted by Floyd Brooker:

When Dr. Hoban and I started out in the Motion Picture Project, we approached one of the prominent universities of the country in order to get the cooperation and assistance of their college of education. The dean of that college of education looked us square in the face. He said, ‘‘If a single professor on my faculty ever uses a motion picture in a class, he will be fired the very minute I discover it, because I will know that he is utterly incompetent.

... And plenty of school superintendents would have supported it’’ (Brooker, 1975).

1.9.3.1. Motion Picture Project. But Charters wanted to harness the educational power of films. Perhaps the people or institutions that would harness the power would share that power themselves. In a report to the ACE encouraging them to initiate the Motion Picture Project, he notes:

That this power (of film) may be utilized equally in raising the ideals and culture of a nation or debasing them is entirely clear. Attitudes toward races may be powerfully directed toward either a better understanding or increased hostility. Fact and error are indiscriminantly accepted by audiences.

The United States should study authoritatively and in statesmanlike fashion the place of motion pictures in our culture, formulate the factors to be considered and work

toward solutions in accordance with the temperament of our people (Charters quoted in Saettler, 1990, p. 232).

Charters did convince the ACE, and the Motion Picture Project went forward; it culminated in seven publications in the early 40s (Cochran, 1942; Noel, 1942; Bell et al., 1942; Brooker & Herrington, 1942; and staff of Tower Hill School, 1942). Two of the seven books list no authors: *The Other Americas through Films*, and *Records and Selected Educational Motion Pictures: A Descriptive Encyclopedia*. *ISvo* books are representative of the seven texts published by the Committee on Motion Pictures in Education, *Focus on Learning* (C. Hoban, Jr., 1942) and *Selected Educational Motion Pictures* (1942). The main thesis in these books is that films should be used in the classroom. Clearly all the authors, important audiovisual scholars, had entered the debate as proponents. Remember, their rhetoric had to oppose those voices who used the Payne studies and the Hays Act to condemn film. All of these founders, whether researchers or practitioners, had to overcome strong cultural objections to film. This rhetorical stance represented one way in which these early AV educators were unified. And perhaps this stance only represented their public voice.

1.9.3.1. Ace Texts. Many of the ACE texts spend long sections attempting to convince educators of the appropriateness of film for the classroom. To illustrate this point we include the tables of contents here (see Figs. 1-8 and 1-9).

The table of contents for the encyclopedia was most unusual for the 40s. This was the first scholarly text to list films exclusively, evaluate them, and offer classifications. The authors assume that films “have arrived” and are “good” for students.

In Hoban’s contents, we see the word movies reflecting Hollywood influence (excerpts from Hollywood films were used in these studies) and suggestions for the place of movies in the school curriculum. We note that an authority, the teacher, will take a hand in controlling these powerful media, and judgment for selection will be passed. The polemic nature of audiovisual discourses has been present in scholarly texts before the ACE books, but not to this extent.

In the Foreword, we learn that the Hoban book was written for teachers and administrators:

... the role of motion pictures in general education has been discussed from the viewpoint of the classroom teacher, so that general education may be improved through the effective use of motion pictures in the curriculum (Hoban 1942, p. v).

In this same Foreword, we learn how Hoban and other members of the Motion Picture Project negotiated the slippery moral path that surrounded cinema in the 30s:

After the completion of the film catalog, it became apparent that, without any attempt to sort the good from the poor, a list of films available to schools might be more

harmful than helpful. It was decided that available films should be evaluated and that these evaluations should be published in order to assist teachers in making proper selection and effective use of films in the curriculum.... When asking the question, “For what purpose, with whom and under what circumstances is this film good?” the Committee went directly to teachers and students for answers (Hoban, 1942, pp. v-vi).

CONTENTS	
FOREWORD	v
ACKNOWLEDGMENTS	vii
INTRODUCTION	1
FILM APPRAISALS AND DESCRIPTIONS	7
SOURCES OF FILMS APPRAISED AND DESCRIBED	337
INDICES	
Subject Classification of Films	343
Index of Film Contents	353

Figure 1-8. Table of contents from *Selected Educational Motion Pictures: A Descriptive Encyclopedia*, 1942, Washington, DC, American Council on Education, ix.

CONTENTS	
FOREWORD	v
AUTHOR’S ACKNOWLEDGMENTS	ix
1. THE MOVIES GO TO SCHOOL	3
2. THE SCHOOL MOVIE	23
3. STUDENT REACTIONS	42
4. FILMS IN THE CURRICULUM	79
5. THE TEACHER TAKES A HAND	103
6. PASSING JUDGMENT	127
APPENDICES	
A. FILM SOURCES AND HOW TO USE THEM	155
B. STATISTICAL TABLES	166
C. FILM RATING FORMS	170
D. FILMS MENTIONED IN TEXT	172

Figure 1-9. Table of contents from *Focus on Learning*, by Charles F. Hoban, Jr., 1942, Washington, DC, American Council on Education, xiii.

As we examine Hoban’s rhetoric, we find it is consistent with his writings from the 30s; he has a foot in both camps. He wants proper selection and effective use of films in the classroom. In fact, he uses state-of-the-art statistical measures to ascertain the appropriateness of a specific film for the classroom. But for his evaluations, he went directly to teachers and students for answers. This action bespeaks the rhetoric of the child-centered, experimental discourse. And the task of effective use is preceded by his attempt to sort the good from the poor and to note films more harmful than helpful. Besides being child-centered, these last two phrases are

drawn from the discourse that embodies notions of censorship for cinema. Hoban is faced with a moral dilemma. Obviously, there are films not suitable for children, but experimental research, on which he partially relied, did not have the power to address value statements; consequently the term effective in experimentation is used to denote that which produces measurable learning gains. For educators in the late 30s and early 40s, just as today, learning gains were only half the story. Hoban knew and stated that some films could be more harmful than helpful, that rhetoric comes from a moral discourse. Caught, as most of us are, between an attempt to assess the cognitive value of instructional materials and their socially responsible or irresponsible position, Hoban devised the following film-rating form. We include it because it is an important early film-rating form and typical of forms to come. Like many current forms, it represents a compromise that is still a compromise today. We note how this rating form foreshadows the later prescriptions for use, i.e., educational purpose, that became objective, classroom procedure that became event of instruction, and preparation that became advance organizer. Yet, Hoban went to teachers and students for their judgment, a humanistic move.

Finally, it is important to note that Hoban believed films were good at teaching concepts, critical thinking, and developing attitudes. World War II research indicated that films were good at teaching facts and adequate at developing attitudes. Subsequent research in educational technology did not approach the issue of critical thinking as a variable in film research, as did Hoban, Dale, and research members of the Payne Studies and the Motion Picture Project.

1.9.3.3. Anecdotal Information. Floyd Brooker provides some specifics about the American Council on Education's Motion Picture Project.

We had a prestigious advisory board on which such people like Mark May and Dr. W. W. Charters, one of the great men and one of the stimulators of the field. We set up a whole series of objectives: (1) Did the film have a role in the classroom as opposed to a role in the auditorium? (2) What did the teachers have to know in order to use a film effectively? (3) What body of films existed that were educationally effective and available? (4) What kinds of educational objectives could films serve?

There were few films available for the K-3 level.... There were more films available in geography than there were in science, and more in science than there were in literature. We would be limited by the flexibility of the teachers who volunteered, and no teacher was used if she was definitely opposed to the idea.

Some of the side questions we considered were: Can students make motion pictures and can it be an educational process? Another one: If you see Hamlet performed in a motion picture, do you read the play? Another one: Does one [i.e., film] take the place or can it be considered as being educationally equal to the other [i.e. book]?

We found that in the opinion of the teachers, the children of the third grade could get 80% or better of all of the concepts in the picture. What they couldn't get were the scientific names: larva, pupa and so forth. But they got 80% of all the meat of the film and they understood the life cycle of the butterfly as well as seniors in high school did. The seniors in high school could use all the technical terminology and, furthermore, they could write about it and spell it correctly. Now, another thing, we found that if we showed a silent motion picture on, let's say autumn, and the students write [sic] an essay on it, the teachers claimed that the students used more creative expression and a wider range of vocabulary than they did when given a verbal assignment (Brooker, 1975).

Brooker's rich description calls attention to new voices in the scholarly audiovisual terrain, that of teachers and students. For the first time, university researchers sought the opinion of students and teachers, believing that their evaluations were valid. And different research questions were being posed to students and teachers, questions such as: Can films teach addition and subtraction? What films can help children learn and are they good for them? We will return to a discussion of this later, but these humanistic interests were short-lived in the history of educational technology and psychology research.

1.9.3.4. Classroom Life. As the audiovisual field was coalescing, educators encountered daily difficulties, not only with film selection but also with screening. A problem encountered in the 40s, as well as before and after, is recalled by Louis Forsdale. He and most of the founders were in positions where they had to "get their hands dirty" with machines on a daily basis. Participants of no other field of education were faced with such a dilemma. Evidence of the precarious nature of operation of audiovisual machines is rife in the oral histories.

Forsdale describes a film situation starting in the 20s and continuing well into the 60s that, while familiar to us today, would have discouraged many educators:

... in the 20s they [schools] made the shift from 35mm to 16-mm, but not many schools had 35-mm projectors when that first change was made. By the 60s large numbers of schools ... had 16-mm projectors even though they weren't using them as much as we thought they could be used. They did have that commitment made ... so it was natural for them to turn to 16-mm film.... Very few people were willing to make the shift to make 8-mm prints.... Standards for 8mm projectors were very hard to come by, very hard, and I, for a while, chaired the standards committee for the 8mm portion of the Society of Motion Picture and Television Engineers. The simple fact was that Fairchild had one projector that they began to bring out, which had a different distance between sound and picture than did an MPO projector which was being brought out.... Technicolor at first brought out a silent projector and were headed all in the direction of silent, as they referred to them, single concept films. And only much later (Technicolor) brought out sound 8-mm equipment. And, in the midst of all this, there then came what was really a

FILM RATING FORMS
Teacher Judgment of Usefulness of Educational Motion Picture

Title of film _____ Silent? _____ Sound? _____
 Source of film _____ Grade in which used _____
 Subject _____ Unit _____
 Name of teacher _____ School _____ Date _____

I. What educational purpose did you expect to achieve in using this motion picture?
 II. What were the strong points of this motion picture?
 III. What were the weak points of this motion picture?
 IV. From the standpoint of classroom procedure, where did you use this motion picture?
 1. _____ To introduce
 2. _____ To present material during a unit
 3. _____ To summarize
 V. What, if anything, was done in preparation for using this motion picture
 1. _____ By the teacher?
 2. _____ By the students?
 V1. What did the students do which indicated that your purposes were or were not fulfilled?
 VII. In terms of what you were trying to achieve, what is your general judgement of this motion picture?
 1. _____ Excellent
 2. _____ Good
 3. _____ Fair
 4. _____ Poor
 5. _____ Usless

STUDENT JUDGEMENT OF EDUCATIONAL MOTION PICTURES

Name of student _____ Boy? _____ Girl? _____
 Title of film _____ Silent? _____ Sound? _____
 School _____ Grade? _____ Course? _____
 Name of teacher _____ Date _____

I. What did you learn from this motion picture?
 II. What were the strong points of this motion picture?
 III. What were the weak points of this motion picture?
 IV. What irritants, parts, or features of the picture did you like best?
 V. What is your general judgment of this motion picture?
 1. _____ Excellent
 2. _____ Good
 3. _____ Fair
 4. _____ Poor
 5. _____ Usless

Figure 1-10. Film rating forms from Focus on Learning, by Charles F. Hoban, Jr.,1942, Washington, DC, American Council on Education,171.

rather altering [?] development on the part of Eastman Kodak, namely, the development of Super 88 film which was incompatible with 8-mm film, because of the special size (Forsdale,1979).

1.9.3.5. Encyclopedia. The Encyclopedia (I on [Selected Educational Motion Pictures: A Descriptive Encyclopedia] is a compilation of 500 of the best educational films available before 1941. (It may have been a follow-up volume to the ACE project, led by Lorraine Noble, to catalog instructional films. The initial publication to emerge from this ACE project was a book with no author, the Educational Film Catalog, published by the H. W. Wilson Co., Saettler, 1990). In an unsigned introduction to the 1942 Encyclope-

dia we are told that the Encyclopedia is a 4'compendium. not of the 500 best films for general education, but of 500 films that have been reported as valuable when used for specific purposes" (Encyclopedia, 1942, p. 1). The claim is not made that objectives for the films will be listed, but clearly they are specified in the appraisals, although in terms of the film's properties, not in behavioral terms. The film descriptions are excellent detailed precis presented in terms of appraisals and contents. The introduction claims, "A complete, but concise, objective description of the content completes the information on each film" (Encyclopedia. 1942, p. 1) [italics are ours]. On the same page, the author refers to the specific objectives for the films. Again, the troublesome is-

sue of evaluation arises. The appraisals presented for each film were evaluations, using the film-rating forms we presented in Figure 1-10. These were solicited from “teachers, and students in cooperating schools, school systems, colleges and universities. . . . About 5,500 teacher judgments and 12,000 student judgments were collected and used in this process” (Encyclopedia, 1942, p. 1). Thousands of films were evaluated in this manner and were further examined by preview panels assembled in Washington by the Motion Picture Project, and after that by the directors of the leading film libraries in the country. This was a complex process at best, which suggests that the project members did not fully trust the judgment of students and teachers. The amazing part of the project, however, is the fact that there were thousands of educational films, produced before 1941, to evaluate. These were sound films, and sound had only been introduced 11 years earlier (Saettler, 1990).

1.9.4 Additional 1940s Scholarship

A spate of scholarly books on audiovisual education appeared in the late 40s. Three representative texts, in fact, were published in 1949: Audio-Visual Aids to Instruction (McKown & Roberts, 1949), Visual Aids (Weaver & Bolinger, 1949), and The Forty-Eighth Yearbook of the National Society for the Study of Education [NSSE] (Brooker et al., 1949). The fact that the prestigious NSSE would devote a yearbook to audiovisual education was a recognition of the scholarly status of the field. By this time, Edgar Dale's *Audio-Visual Methods in Teaching*, first published in 1946, was in its seventh edition. The fact that Dryden Press had to publish seven editions of the Dale text within 3 years attests to the importance of Dale and his experiential approach in the AV world of the 40s. The authors of these three texts must have been highly influenced by Dale, because nowhere can we find a reference to behaviorism, or Thorndike, and very few social efficiency assumptions and language slip through their writings. There is a major difference, however, in the resources used to assemble these books, and this difference marks a critical point in the growth of the field (which was still identified with the adjective audiovisual at the time).

1.9.5 A Small Circle of Friends

AV researchers in the 20s and 30s based their learning theories primarily on Thorndike and other behaviorists, and we see them cited in 20s and 30s audiovisual texts. In these texts, we also see the mental measurement proponents cited. It has been shown that Dale took an opposing stance and called on Dewey, an opponent of behaviorism, to develop his learning theory. By the late 40s, however, many authors had stopped citing scholars outside the field and started relying only on the body of literature that had been generated by AV researchers in the 20s, 30s, and 40s. In the NSSE Forty-Eighth Yearbook, for instance, Dale, Finn, and Hoban cite early AV experimenters, Knowlton and Ellton, Rulon, Weber, Freeman, McClusky, and others. They also cite one

another (Brooker, 1949). Writing other chapters in the same book, Larson cites Hoban, Dale, Brooker, and Herrington; Brown and VanderMeer cite themselves, Hoban, Carpenter, Dale, Meierhenry, and other AV writers. Similar citations exist in other chapters. These are not the exclusive realm of all citations. Many other business and administration texts are cited. What we would like to point out here, however, is that references to learning and curriculum theorists outside of the AV field have disappeared. This is both helpful to the field and harmful. Certainly, it indicates that finally there is a critical mass of AV scholars and a significant body of knowledge forming, and yet the theoretical stances and the epistemology of their discourses have gone underground. By citing Dale and earlier experimental researchers, these authors did not take the time to cite the primary sources of learning or curricular theory, as AV scholars of the 20s and 30s had done. Although their language discloses their theoretical foundations, underlying assumptions were undisclosed and unexamined. (This is also true of many texts in the early 50s, with the exception of the Wittich and Schuller book.)

1.9.5.1. Scholars of the 1940s. The table of contents in the Weaver and Bollinger, and the McKown and Roberts' texts, indicate that the scope of topics addressed has opened up, and we include a partial listing here (see Figs. 1- 11 and 1-12).

What is different about these tables of contents and those of the 30s is the fact that experience replaces experimentation, and the view of media opens from a consideration of radio and film to include graphics, pictures, models, etc. A child's educational experience is carried outside the classroom to include trips and tours, and media play a large part in those excursions (McKown & Roberts, 1949). Weaver and Bollinger use a similar approach to categorize audiovisual knowledge and continue to offer administrative advice.

That the National Society for the Study of Education chose to publish a yearbook on audiovisual materials of instruction indicates that the scholarship of AV writers was finally garnering recognition from other education scholars. The book is noteworthy for several reasons. We are, of course, interested in the rhetoric of the specifically scholarly sections. (Several descriptive chapters of audiovisual departments in schools and school districts are also included.) We have already noted the manner in which scholars cite a small circle of friendly AV researchers, but several curriculum and learning discourses are present in the text as well. It is more multivocal than any AV text before that time.

In this yearbook, we note a conflated discourse growing up around Dale—almost every author quotes Dale; and Brown and VanderMeer use Dale's Cone of Experience. Dale's own voice is conflated as he mixes the humanistic and experiential aspects of the child development curricular and learning movement with the sequential and hierarchical structure of task analysis proponents such as Charters'. (He worked on the Winnetka Plan and for Charters in the Payne Fund Study).

Dale's Cone of Experience stands as an example of this mixture. It is at once experiential and hierarchical in its listing of experiential events. And, while offering an intriguing and popular model, it was based on conflicting theoretical assumptions.

The research chapter by Dale, Hoban, and Finn does not lean on behaviorism, but touts early perception theory. And in this objective chapter, written in third-person singular, these authors shift to first person plural, to "we," when speaking about World War II and war research. It is an important reminder to us, almost half a century later, of the patriotism that permeated not only education but also society at large during what Ibible (1984) calls "The Good War." It is not a trivial point that this patriotism and close relationship with the military informed the design of instruction, educational media, and, as we see in this book, the rhetoric of the founding scholars of the field.

The full table of contents for the Forty-Eighth NSSE Yearbook is included here to illustrate the breadth and scope of the audiovisual field in 1949 (see Fig. 1-13).

In 1949, the official objects of study in the audiovisual field included teaching, learning; communications theory, and machines, with their application and administration. The audience was composed of teachers, librarians, and higher-education faculty interested in AV, government officials at the state and federal level, and people in the corporate sector. Its parameters of operation were primarily elementary and secondary school classrooms, libraries, and, secondarily university departments of education, and state and federal education agencies.

The book closes with a delightful first-person narrative by Walter Wittich of his experience in a small classroom. Film, in this classroom, transformed the learning experience not only for the students but for Walter and the teacher as well. Narratives are generally considered nonscholarly but are highly personal and can be persuasive. It is to the credit of NSSE that they allowed this touching story to be included at the end of a scholarly text. It is also indicative of the persuasive voice with which the founders spoke. For audiovisual education to be successful, for programs to be adopted and grants to be garnered, they had to be convincing. The rhetoric of persuasion existed side by side with that of scholarship.

I.	Visual Aids and the Sense of Vision
II.	Comerial Materials and Thier Use in Secondary Schools
III.	Well-Known Visual Aids That Help the Teacher
IV.	School Journey—a Visual Aid
V.	Types of Visual Aids in Common Use
VI.	Novel Types of Teaching Aids
VII.	How to Make, Disply, and Use Charts
VIII.	Projected Teaching Aids
IX.	Slide and Motin Picture Films
X.	Making a projectin Set-up
XI.	The Use of Motion PICTURES
XII.	Handling, Maintenance, and Storage of Films
XIII.	Films for Vocational and Technical Schools-Kinds and Use
XIV.	Administration of Visual Aids Program
XV.	Equipment for Visual Aids Center
XVI.	Teacher Training in the Use of Visual Aids
XVII.	Needs and Trends in Visual Education
XVIII.	Organization of Community Film Council
XIX.	Research in Visual Education Index

Figure 1-11. Table of contents from *KsualAids*, by G. Weaver and E. Bollinger, 1949, New York, Van Nostrand.

1.	The Scope of Audio-Visual Instruction
2.	The Functions of Audio-Visual Aids in Learning
3.	Principles Underlying the Successful Use of AudioVisual Aids
4.	Objects, Specimens, and Models
5.	Graphic Materials I: Maps and Globes
6.	Graphic Materials II Graphs, lilustrations, Posters, Cartoons
7.	Flat or Unprojected Pictures
8.	Projected Still Pictures
9.	The Motion Picture I Values, Scope, and Uses
10.	The Motion Picture II: Selection and Care of Materials and Equipment
11.	School Trips and Tours I Purposes, Types, and Destinations
12.	School Trips and Tours II Planning, Conducting, and Capitalizins

Figure 1-12. Table of contents from *Audiovisual Aids to Instruction*, by H. McKown and A. Roberts, 1949, New Yorlc, McGraw-Hill, ix-x.

<p>I. COMMUNICATION IN THE MODERN WORLD FLOYDE E. BROOKER The Social Significance of Communication Analysis of Languages, Media, and Forms of Communication The Communications Revolution The Development of Pictorial Forms of Communication and Their Application to Education Education and the Crisis in Communication</p>	<p>Coordinated Long-Term Plannings Selection of Visual Materials Preparation, Inspection, and Repair of Materials Cataloguing, Ordering, and Delivery In-Service Education in Utilization</p>
<p>II. SCHOOL USE OF AUDIO-VISUAL INSTRUCTIONAL MATERIALS JAMES W. BROWN AND A. W. VANDER MEER Introduction Audio-Visual Materials and Learning Experiences Integration of Audio-Visual Instructional Materials with the School Curriculum Present Practices in the Use of Audio-Visual Instructional Materials and Methods in the Schools Some Encouraging Trends Some Deterring Factors</p>	<p>VIII.. THE PROGRAM OF AUDIO-VISUAL EDUCATION IN RURAL SCHOOLS CHARLES FREMONT MILNER What Are Adequate Objectives for the Rural Audio-Visual Program? What Methods Have Been Suggested for Reaching These Objectives? What Is the Status of Audio-Visual Programs in Rural Areas? What Improvements Are Feasible in These Programs?</p>
<p>III. OBSTACLES TO THE USE OF AUDIO VISUAL MATERIALS CHARLES F. HOBAN, JR. Introduction Characteristics of Audio-Visual Materials More General Educational Determinants Implications for Teaching</p>	<p>IX. STATE PROGRAMS OF AUDIO-VISUAL EDUCATION FRANCIS W. NOEL Principles Directing the Operation of a State Audio-Visual Unit Present Status and Trends of State Programs Description of the Initiation and Operation of a State Program of Audio-Visual Education</p>
<p>IV. THE TEACHERS' DECISIONS STEPHEN M. COREY AND EDGAR DALE Introduction The Four Instructional Questions Overloading the Teacher</p>	<p>X. PRINCIPLES OF ADMINISTERING AUDIO- VISUAL PROGRAMS FRANCIS W. NOEL Why Should a Department of Audio-Visual Education Be Established? What Should Be the Functions of an Audio-Visual Department? What General Principles and Procedures Underlie the Adminis- tration of a Department of Audio-Visual Education?</p>
<p>V. PRESERVICE TEACHER EDUCATION FOR USE OF AUDIO- VISUAL INSTRUCTIONAL MATERIALS WILLIAM G. GNAEDINGER Introduction The Content of Preservice Audio-Visual Courses Teachers' Needs in Audio-Visual Training The Place of Audio-Visual Training in the Teachertraining Program The College Audio-Visual Center</p>	<p>XI. SUGGESTED ANSWERS TO SOME PERTINENT QUESTIONS IN THE AUDIO-VISUAL FIELD L. C. LARSON Introduction Role in Education Materials Utilization School Preparation of Materials Physical Facilities Administration and Finance Responsibilities of State Agencies and Higher Institutions General Aspects of Research Audio-Visual Materials in World War II Instructional Motion Pictures The Theatrical Motion Picture Field Trips</p>
<p>VI. IN-SERVICE TEACHER EDUCATION FOR USE OF AUDIO- VISUAL INSTRUCTIONAL MATERIALS AMOR DE BERNARDIS Introduction Factors Which Contribute to a Successful Program of In-service Teacher Education for Audio-visual Aids Evaluating the Results of the Program of In-Service Education Summary</p>	<p>XII. RESEARCH ON AUDIO-VISUAL MATERIALS CHARLES F. HOBAN, JR., EDGAR DALE, JAMES D. FINN Still Pictures, filmstrips, and Lantern Slides Museum Materials Graphic Materials Radio and Recordings</p>
<p>VII. THE PROGRAM OF AUDIO-VISUAL EDUCATION IN CITY SCHOOL SYSTEMS ELIZABETH GOLTERMAN Introduction The Roots of Visual Education in St. Louis Fundamental Principles: Guide to Development of Audio-Visual Education Patterns Administration and Personnel of the Division of Audio Visual Education</p>	<p>XIII. SO THE CHILDREN MAY LEARN W. A. WITTICH</p>

Figure 1-13. Table of contents from the Forgy-Eighth Yearbook of the National Society for the Study of Education, 1949, pp. vii-x.

1.9.7 Summary of Nonmilitary Audiovisual Scholarship in the 1940s

During a decade when Deweyesque ideas became entwined with social efficiency notions of curriculum in the schools and the country “went to war,” audiovisual scholarship became closely allied with the classroom and students’ practical life experiences. As we have shown, another conflated discourse was formed which primarily embodied a humanistic theory of learning, but incorporated some behavioral film research from the 20s and Charters’ model of task analysis. The new discursive space was rich and multivocal, accommodating varying voices. The rhetoric had opened up from a narrow behavioral rubric to one that included recognition of the mind and consciousness in theories of learning. By the inclusion of concepts of experience and child development, social and cultural issues were perforce included in the scholarly inquiry of the period. Issues of ethics in the evaluation of “good or bad” films had to be broached. Research questions moved from a consideration of micro classroom issues to significant issues, and, most importantly, researchers consulted students and teachers to ascertain if something “worked,” i.e., to find out if a film taught. (This humanistic technique is enjoying a return in schools of education today. Because U.S. citizens have sharply criticized the institution of public schools and schools of education, educators are reexamining their methods of inquiry; some are attempting to focus on larger learning issues.) This tendency to “go directly” to teacher and students would not be tolerated by experimental and quasi-experimental researchers.

That the opinions of teachers were valued in this decade is significant for many reasons. Such treatment recognized the professional nature of their work and certified them as experts. With the introduction of programmed instructional materials and behavioral objectives in the decades after the World War II, much of the art of teaching was replaced by prescriptions. Certainly, the curriculum became more standardized, but in Michael Apple’s (1986) term, the teacher became “deskilled,” much as craftspeople became deskilled by the introduction of machines to replace their work.

What emerges in the rhetoric of scholarly texts and oral histories of the 40s is a diverse field, tightly tied to classrooms, multivocal, and accepting of diverse concepts. In this climate, debates surely raged about what constituted the field, i.e., communications, machines, films; and about how to select films that would teach; about how to ascertain how films would teach; and about how to select wholesome films for children. It was probably an era of heated debate about these issues, but the issues were broad, the opinions varied, and the discourse open. What it did lack was rigor and agreement.

1.10 MILITARY RESEARCH AND EDUCATIONAL TECHNOLOGY

From the research on media during World War II, two new academic fields emerged, Communication Arts and Educational Technology. (Saettler recalls that W. W. Charters first used the term educational technology, and James Finn is often considered the first to write the term instructional technology [Saettler, 1990, p. 17n].) Generally speaking, communication researchers focused on those aspects of WWII research that impinged on the affect of audience groups. Even though Hoveland, Lumsdaine, and Sheffield conducted some research on training films, their main contribution was the extensive investigation of the Why We Fight film series and the attitudes of recruits. This work, in fact, became the basis for the first major scholarly work in the new communications field, Experiments on Mass Communications (Hoveland, Lumsdaine & Sheffield, 1949). Formal academic departments of educational technology did not coalesce at universities until the 60s, but informal work in audiovisual research had been conducted in colleges of education, such as Yale, Columbia, the University of Chicago, Indiana University, and the University of Wisconsin since the 20s (Hoban & Van Ormer, 1951). As we have seen, the discourses that informed academic audiovisual texts in the 30s included behaviorism, specifically connectionism; mental measurements, specifically early IQ work; social efficiency; and a mixture of persuasion, corporate economics, and governmental concerns. With Dale’s work ascendant in the 40s, some of these discourses became subordinate for a short while. The nexus of discourses, however, from the late 20s and early 30s ran through the 30s, 40s, 50s, and 60s until university departments of educational technology were established. In fact, if this original amalgam had not existed, the field would not have been established.

If WWII research formed the basis for the modern field of educational technology, it is important to understand which theories of learning inform that work. What assumptions and concepts were important to the researchers, and what values impelled them to join the enterprise. Again, how this body of knowledge was established can be ascertained by examining the rhetoric of this research.

It is our theses that certain psychological strands of extant audiovisual discourses formed a basis for investigating film and other media in the Army and the Navy during this period, but that specific military discourses entered the field at this point in time and helped shape educational technology in the academy. Both psychological and military discourses are evident in the WWII research texts. Furthermore, we believe that the juncture of behaviorism (this time, operant conditioning, not connectionism) and military pedagogy was fortuitous (a marriage made in heaven), and together they formed a solid theoretical base for the field. The way knowledge was structured in operant conditioning and military pedagogy was quite similar.

1.10.1 Military Training

Military pedagogy, which should more rightly be called military training, had existed for many years before WWII but was refined in the preparation of thousands of recruits during this conflict. It was training rather than education and had to accomplish very specific objectives in a short period of time. This training did not have time to be other than top-down in delivery. In addition to being hierarchical, it broke instruction down into small parts, often modularizing curriculum. It used demonstration, supplied opportunities for many trials or practice sessions, and was often self-paced. (Pressey's self-paced prewar teaching machine was ripe for induction into the military. With Skinner, Pressey expanded the capabilities of the machine to include simulations for pilots, but the innovation only built on former military practices of demonstration, trial and error, and self-paced, standardized instruction.) As had educational researchers in the 20s and early 30s, the Army and Navy made use of IQ tests as screening devices to place recruits in appropriate training units.

1.10.2 Training and Curriculum

There is ample evidence of the influence of military training on audiovisual and classroom practices. Books published after the war provide information on mass training. Military training had to be, of necessity, "quick, efficient, and standardized.... More learning in less time was perceived to be a necessity and became an immediate goal . . ." (U.S. Navy Department quoted in Miles & Spain, 1947, p. 4). We have already encountered notions that curriculum needs to be efficient and effective; but to those ideas, we now add goals of speed and standardization. It is important to point out that this approach was absolutely necessary to prepare recruits to fight:

. . . the majority of men trained for military duty were not accustomed to serious study and prolonged mental concentration. This condition, plus the diversity of backgrounds, tended to encourage the development of instructional programs based on "learning by doing" and appeal to all the senses. Especially were these techniques of visualization thought applicable to trainees with less than average mental ability. The generally accepted thesis was that trainees would learn more in less time and retain more of what they did learn for a longer period of time through the use of visual aids. The following statement . . . is characteristic of - a generally prevalent viewpoint in all military instruction: "To accelerate learning, as well as to graduate the lower caliber student who reported in increasing numbers, instructors reduced difficult principles and operations to the simplest terms by visual, auditory, and other means" (Miles & Spain, 1947, pp.4-5).

Several aspects of this passage are of interest, but the urgent overall message here is that the necessity to train quickly thousands of recruits with varied academic ability led to reducing instruction to its simplest terms. There was obviously no room for critical thinking in wartime training.

Yet, at this specific moment in time, when behavioral educational psychologists were designing instruction and audiovisual specialists were producing training films, we believe that certain beliefs about instructions grew out of these practices. In this curricular procedure, the audience had to be well understood, the objectives of instruction had to be precise and clear, and evaluation measures had to be concrete. It was as if education had to be reduced to instruction that further had to be reduced to training. The trouble with this reduction was that, after the war, a reductive training model was introduced to curriculum and textbook design and, ultimately, to teacher-training programs and classrooms. The constrained reductive model of audience, task and evaluation, which served the Armed Forces so well, was transferred by the educators who designed it back into the public school arena. The training model was equated with instruction, and education for a time did not open up. The critique of behavioral objectives mounted in the mid-70s unseated the training model as the central trope of curriculum theory, but it is still part of the model that informs many instructional design techniques today.

About these training manuals, Walt Wittich says:

Incidentally, the training guides (which I wrote) were based on the generalizations that I uncovered in writing my Ph.D. thesis . . . [They included training for] films on how to handle weapons, ah, also the Brooker films on how to weld bulkheads and how to weld steel plates together and that kind of how-to-do-it film. The whole objective, or the goal rather, was to give the instructor who was drafted into an instructional position, with which he was probably not too familiar, some tangible, direct guidance in how to introduce, how to involve the learner, and how to use intelligently, a 16-mm training film.... The guides were written for the instructors to be placed in the hands of the students, of the enlisted men, the draftees. But in many instances, it never got beyond the teacher, because the teacher then felt this was a good way to interpret the situation. I was so enthusiastic about the possibilities of increasing the usefulness of films through appropriate introduction techniques and preliminary techniques (Wittich, n.d.) [italics ours].

Here is fledging rhetoric about what would later become design elements. Although certainly not the first, Wittich was writing about instructional design elements, but not identifying them as such in his dissertation of 1944.

1.10.2.1. Day-to-Day Military Training. No matter what design or training models film educators used during the war, there were day-to-day problems about screening and reception. Louis Forsdale describes some hurdles:

. . . there were some very interesting things that [Finn] got involved with, and that I had the pleasure of helping him carry through. One of the interesting things was that the classrooms that were being used in Leavenworth were huge. I mean 800 students in a single room; that was the largest classroom probably, down to the smaller class-

rooms of, like, 200 in a single room. Those classrooms, by the way, were filled with people [whose] lowest rank [was] major. One of the things that Jim did was develop standards for the visibility of materials that could be seen by 800 people, by even the person in the last row (Forsdale, 1979).

This was training at its most basic. These educators, while following an efficient training model, often, did not have the luxury of time to create certain instructional films. Forsdale continues:

We found that it would be terribly useful if we had raw footage, motion picture footage, on hand in Leavenworth, just raw footage, not cut into films at all. And one of my jobs every week was to go down to Kansas City, Missouri, which was about 30 miles away—45 revolver strapped around my waist, not having the slightest idea what I would do if push came to shove—accompanied by two MPs, and a plane came in every week (to Kansas City) with different footage of prime-time was footage from all theaters. [I] brought it back and we had two men and they all but memorized what was in the footage. And then they would go to Colonel so and so, who was teaching about important bridges, new important bridges that the Germans were using, and he would say, “By the way, I’ve got 3 minutes of footage that came in last week. I wonder if we could incorporate that?” Whereupon the instructor took it upon himself [to say Yes]. It was very bad form to say No, because the general was always in favor of backing Jim up on these ventures (Forsdale, 1979).

For us, this anecdote provides a quick gloss on instructional design in wartime and the interplay of authority from both the military and audiovisual spheres.

Robert Frost says, “And reality broke in with all of its matter-of-factness.” War was the reality of the 40s, and Floyd Brooker reminds us of the authenticity of Frost’s observation:

We had altogether 20 million men in the Armed Forces and all of them were trained with films. Some of the training was ridiculous. Well, I’ll explain that. At one point in the war, they decided that there were too many motion pictures for all the soldiers to see. So the brass went down the list of films, and they selected 57 films that every soldier should see. So they sent out wires all over the country to all the forts and training places. The general in charge of Fort Hayes in Columbus [said] “look at this list of films.” He figured out that the biggest place he had on this post was the mess hall. So he had breakfast served at 5 o’clock. And by running them (the films) at 5-hour lots, all the men by midnight that night could see all 57 films. And they saw them one right after the other for 5 1/2 hours each sitting. But he was the most pleased commander you ever saw in the country, because he sent a telegram back to the War Department that night: “Order So and So Received. Order Executed.” And we audiovisual people always said the word executed, that was really the word for it (Brooker, 1975).

1.10.2.2. Formalizing Training. But the written war discourse formally entered curricular materials during and after the war. Miles and Spain help us understand the manner

in which methods of training became inscribed in the Army and Navy and ultimately in public classroom texts:

The most pervasive influence throughout the training program tending to extend the production and use of training aids was the fact of military [italics theirs] dominance and control of training.... Directives and “doctrine” in a military institution have the effectiveness of legal compulsion, in practice if not in theory. If a decision, or even a suggestion, is made at the “top” to employ a particular device in teaching signaling, for example, this device will be used. Or if it is thought advisable for all trainees to see a particular film, then these trainees will see the film. A dramatic example of this thoroughgoing influence is the fact that most Army men in the continental United States saw the movie *Two Down and One to Go* within a few days after VE Day.... Training aids designed for particular instructional situations became virtually mandatory, and these inspections and visits tended to assure compliance with directives and ~~nm<datixs (Miles & Spain, 1947, p.8).

Far from being critical of military pedagogy, Miles and Spain were writing a descriptive book, *Audiovisual Aids in the Armed Services*, for the Commission on Implications of Armed Services Educational Programs. The transfer of this method of training was being explored for schools. This commission, authorized by the American Council on Education, published 12 books in 1947 and 1948 to explore the implications of military training for public education. Some titles were *Educational Lessons from Wartime Training* (Grace et al., 1947); *Area Studies in American Universities* (Fenton, 1948); *Improving Textbooks the Army and Navy Way* (Frauens, 1948); *Curriculum Implications of Armed Services Training* (Goodman, 1948); *Opinions on Gains for American Education from Wartime Armed Services Training* (Chambers, 1948). George Zook, president of the American Council of Education in the 40s said of this series:

The Commission on Implications of Armed Services Educational Programs began work in July 1945. It undertakes to identify features of the wartime training and educational programs worthy of adaptation and experimentation in peacetime civilian education of any and all types of levels. It also undertakes to make available to the public well-considered answers to the questions: What should education in America gain from the experience of the vast wartime training efforts? What are the implications for education and the national culture and strength, now and in the future? (Miles & Spain, 1947, p.97).

These texts are important here, in fact more important to public education than were the audiovisual set published by the American Council on Education and mentioned above. What they indicate is that general educators, not only AV educators, carried lessons about how to teach from the Army and Navy back to their civilian classrooms. Among them were teachers and administrators who were convinced of the efficacy of military training and, consequently, ripe for the upcoming “programming” of the curriculum by instructional designers and the fiat to teach by behavioral objectives.

To return a moment to the rhetoric of the quote from Miles and Spain, we note the introduction of words and concepts that had not been generally encountered in curriculum, nor in AV texts prior to WWII. There is dominance and contrDls directives and doctAne, legal compulsion; we had not often encountered the term trainee before this time. Also, notions of inspections and compliance are new.

Methods of teacher training in the Armed Services were explored for transfer to public classrooms. Teacher training, like behavioral protocol, was standardized in the military.

Voice, diction, gestures and other pelsonality traits were stressed as pertinent to the effectiveness of the teacher.... Supervisors also assisted instuctors in developing other good teaching habits, for exampb, standing aside from blackboards or other gnphic aids and using pointers (Sles & Spain,1947, p.10). Although these were excellent teaching hints, there was an attempt to standardize the appearances of teaching, just as marching. The content to be taught was prewritten; strategies were ignored.

1.10.2.3. Designing Texts. Methods of designing military manuals were gleaned for clues to the design of school-room texts. The pride of the Armed Forces, however, were the standardized manuals that they produced during the war years and released after the war. Many of them were selfinstructional, stepwise texts “in modern magazine style containing all the basic information which students should acquire in primary training or in advanced training” (Miles & Spain, 1947, p. 11). Publicity men, professional editorial staffs, and commercial artists had been drafted into the Armed Forces to help design and produce these manuals:

. . . the fact that such manuals were thought necessary and were accepted so wholeheartedly indicates that civilian textbooks perhaps could often be improved in format, size of print, and degree of visualization (Miles & Spain, 1947, p.12).

Benefiting from these well-designed manuals, however, were the Army and Navy technical reports of audiovisual research. Most of them were presented in black textured covers with large gold lettering and official gold seals. The 8 1/2-by-11 report was designed in double columns with many different-sized headlines in both bold and plain text. Font size was varied in the heads, and there was plenty of white space in the text. Ample use was made of well-designed graphs and charts, and the text was easy to read. The magazine influence was evident in these reports and has remained so in at least part of the educational technology field today, namely, that of instructional design. To get a feeling for the structure of some of these training manuals, consult any one of a number of local production textbooks on the market today. They are good cookbooks and certainly supply the student in a production class with enough information to get started.

1.10.3 Content and Rhetoric of War Research

The research conducted in World War II consisted primarily of investigations into the training power of film, and

the results are common knowledge today in many educational technology graduate programs. We learned that we use motion to teach motion tasks, that film was good for teaching facts, and adequate for teaching concepts, and that it had some effect on motivation and opinion. The reason educational technology researchers used these studies as a base for their work in the 50s and 60s was because they believed that the large number of participants used in the studies supported the statistics employed to measure results. In a companion piece to Hoban and vanOrmer’s 1950 well-designed, succinct, and terse Instructional Film Research Report, the Instructional Film Research Program, sponsored by the Army and Navy, prepared a 16-page booklet, Practical Principles Governing the Production and Utilization of Sound Motion Pictures (Hoban & vanOrmer, 1950) that summarizes the longer succinct version. The booklet again is handsomely designed in an 8 1/2-by-11 inch format with a professionally lettered buffcover with a brown binding. On the final page of the booklet the authors conclude:

Four conclusions which apply to motion pictures in training, orientation, and information clearly emerge from the review of film research:

1. The educational effectiveness of films can be improved, but to do so steps must be taken all along the line from the origin of the film idea to the utilization of the film in instruction, and not simply at the production stage.
2. The effectiveness of films in instruction depends on the relationship of the film content to the audience and the context of their use, and not simply on the film itself.
3. Within the film, treatment of the content in terms of psychological and instructional principles governing audience reaction is of greatest importance. Film techniques involving special effects and elaborate musical scores are of minor importance.
4. Of all the devices of mass communication, motion pictures and their counterpart, television, are unquestionably the most powerful (Hoban & vanOrmer, 1950, p. 16).

Additional research, conducted during WWII, explored the effectiveness of other audiovisual modes of instruction as well as the appropriate environment for the presentation of instructional materials.

1.10.4 A Pre- and Postwar Voice

The difference in voice, namely, form of address, tone, and language use, may be compared in two similar pre- and postwar projects by the same author. In 1937, Charles Hoban, Jr., contributed “Part Three” and “Part Five” to Motion Pictures in Education, A Sumtnary of the Literature (Dale et al., 1937). “Part Five” was a 54-page summary of “Experimental Research in Instructional Films” and recounted the film experiments conducted to date. In 1937, Hoban reports the findings of the Knowlton and Tilton studies in the following manner:

Small, statistically reliable, differences in favor of the classroom groups, were obtained in six out of ten comparisons in immediate tests; in four of these six, a difference was still evident the following September (Hoban & vanOrmer, 1950, pp. 8-41).

The point of comparing the more general description with the precise, scientific version is not to cast aspersions on either. In fact, readers wishing to replicate Knowlton and Tilton will benefit from the second exposition. But it is important to note the evolution of this scientific language. With Knowlton and Irlton (1929), Freeman (1924), Rulon (1933), and Devereux (1933), practices of laboratory experimentation were introduced to the audiovisual field, and they applied these practices with state-of-the-art competency. These practices were refined, however, with the war research and, at that moment, permanently inscribed in the dominant discourse of the field. We do not suggest here that the child-centered theories of learning would have suited adult recruits in the Armed Forces, but the reverse did occur. The audiovisual discourse established in WWII training and research was applied to children in their classrooms. As we listen to Hoban's voice before and after the war, we can identify specific concepts that the moresophisticated application of true experimental designs in the military contributed to the field.

In "Part Five" (Dale et al., 1937, pp. 307-61), Hoban rarely uses the word experiment but favors the phrases experimental research or experimental study or experimental attack. With the use of the adjective instead of the noun, Hoban implies these studies are not experiments but similar to experiments. In fact, he tips his hand on this topic when he notes, "In educational research, this law (holding one variable constant) is a principle to be approximated, not a condition readily obtained" (Dale et al., 1937, p. 315). The term experiment is used liberally in the Army, Navy Report (Hoban & vanOrmer, 1950, 1-1-C-1) with no caveats; it has been sanctioned.

In writing a section of the 1937 text (Dale et al.), Hoban lists the "Criteria for Evaluation of Experimental Research in General." They are:

1. Significance of the problem
2. Selection of factors for study
3. Assumptions
4. Appropriateness of general procedure
5. Significance of raw measures
6. Representativeness of sampling
7. Adequacy of data
8. Analysis of data
9. Interpretation of observations and analytical findings (Dale et al., 1937, p. 312).

Yet, as Hoban (Hoban & vanOrmer, 1950, 1-1-C-1) evaluates research after WWII, his headings for reporting all stud-

ies are Experimental Design, Findings, and Evaluation. Some entire expositions under the "Evaluation" heading follow:

Evaluation. As we mentioned above, there seems to be a disagreement in the research findings on this problem. The collateral evidence is somewhat in favor of distributed showings. However, Ash's study involved a sufficient number of films and sufficient diversity of population to support the conclusion that, under instructional and physical conditions sometimes found in practice (where the instructor plans no immediate discussion of the film), 1-hour film sessions may be conducted without substantial loss in overall group learning. This conclusion applies to film sessions involving a subject divided into three or four major and self-contained sequences. Rate of development and content density probably also enter into the problem of long and short film sessions to influence the result (Hoban & vanOrmer, 1950, pp. 8-38).

Evaluation. This study lends support to the theory that relevant introductory remarks have an anticipational or motivational effect, as well as to the theory that learning results from the practice effect of repeating material in different symbolic forms (Hoban & vanOrmer, 1950, pp. 8-36).

A number of things occur in these quotes which clearly indicate the tacit formation of a professional discourse that will control entry into the field. It will constitute a style to be taught by professor to student. This rhetoric, complex with cumbersome sentence structure, yet with precise adjectives and nouns, is a laboratory style not seen to this extent in audiovisual discourse before this time. Was there a necessity for this voice? One might answer Yes when considering the culture of the academy, especially that of educational psychology departments. Founders were, after all, establishing academic turf. We speculate that writers hoped the "scientific" style would clarify the communication, or deliver a more accurate message. We note that it did reach for accuracy, yet in their haste for a professional style, Hoban and vanOrmer (and other authors) became sloppy epistemologists. They use the term theory, twice above, to designate a thesis. Hoban did not make such a mistake before the war, and the rich notion of theory becomes reduced to thesis or further reduced to hypothesis. In the Ash evaluation above, the phrases rate of development and content density, introduced for the first time at the end of this report, tend to obfuscate rather than clarify the evaluation. Their meanings are private.

1.10.5 Military Manuals in the Schools: Postwar Curriculum

In the late 40s and early 50s, Army and Navy training manuals such as Photography, Vol. 1 and Photography, Vol. 2 (Bureau of Naval Personnel, 1952) became quite popular in vocational and technical schools. This was, after all, the period of the life adjustment curriculum, and by 1949 more students were studying health, music, and art than any other fields. More than half the subjects in the public high school

curriculum were in the fields of social studies, vocational education, home economics, and agriculture (Perkinson, 1968). There was a new emphasis on aviation in the curriculum which led to the founding of schools such as New York High School of Aviation Trades. Thousand of manuals were prepared by the Armed Services, either by their own personnel or by civilian subcontractors, sometimes at universities. The United States Armed Forces Institute at the University of Wisconsin-Madison was one such subcontractor (Kliebard? 1993). No author's name appears on these manuals, which were written in the formulaic stepwise fashion of military rhetoric. By 1952, the photography volumes were in their fourth printing, along with thousands of other training manuals. Although "how to" manuals existed in trade schools prior to WWII, it can be said that the military perfected this genre for vocational and technical education. Undoubtedly, these manuals influenced the structure of later instructional development texts. Although it was necessary during wartime to motivate men to fight, even a photography manual urged postwar students to arms:

The camera is a weapon just as a battleship's big guns are weapons.... A vital reconnaissance or engagement picture may determine the plan or strategy that decides a battle.... You are the important man-the man who establishes the viewpoint of the camera, which means the viewpoint of the Navy (Bureau of Navy Personnel, 1952, Vols. 1, 3, p. 17).

Learning a topic for war or armament was a patriotic value that slipped into the public school curriculum in the 50s, not only in trade schools like Aviation Trades High School but also in the general teaching of mathematics and science. This value was reinforced by the passage of the National Defense Education Act (Becker, 1987). These training manuals were replete cookbook-like texts designed for self-study. Because of the premise, however, that recruits were not smart, the tone of these texts was often patronizing:

"Now do you take off? Well not quite yet. But you're getting warmer.... Now use a bit of simple algebra. If that term frightens you, forget it. Just say that you will take a short cut to finding the amount of ground which the picture will cover" (Bureau of Naval Personnel, 1952, Vol. 2, pp. 172,173).

On these pages of the photography volume and on many other pages, the author has employed what later became known as instructional design elements (Gagne & Allen). The unknown author uses questions to gain and/or maintain attention, and positive feedback is provided much as it is in programmed instruction.

The rhetoric of military training combined with that of operant conditioning entered the discursive audiovisual space during World War II and after. The mechanistic language of instructional materials distributed the effects of this combined discourse in classroom textbooks, programmed materials, and instructional media.

1.10.6 Postwar Scholarship

Research in the military and on university campuses became inextricably conflated after WWII and remains that way today. James Brown notes that "the universities then [during wartime] as now (1970s) were playing an important role in the whole armed forces program" (Brown, n.d.). Two representative military/university research studies to be published in the 50s were Motion Pictures as a Medium of Instruction (Fearing, 1950; see Fig. 1-14) and Instructional Television Research Reports (Twyford & Seitz, 1956). Both texts have some notable similarities; the studies are tightly controlled and true experiments, and the reports stress the statistical and experimental nature of this enterprise. This research appears to be more and more like that conducted in a psychology laboratory. The word subject indicating a study participant appears for the first time in our reading of audiovisual research. Fearing (1950), in fact, uses subject to indicate participant and elsewhere to indicate topic to be studied. Twyford and Seitz (1956) do not; for topic to be studied they use the word lesson. Neither text uses the word audiovisual; Fearing (1950) uses the words film, motion picture, and medium, but shies away from audiovisual, as do Twyford and Seitz (1956). They use the words television, telecasts, moving pictures, and kinescopes. These three authors were professionally located outside of colleges of education: Fearing in social science and Twyford and Seitz in psychology. We see a tendency here, and in other 50s texts, for some scholars to distance themselves from the prewar audiovisual research and to attach themselves to the "official," rigorous, and mechanistic research of the Armed Forces. Fearing, who finished his research in 1944, sounds, what we find, to be the last warning in this period about the borrowing of experimental design:

There are important limitations in such a program. It is doubtful if complex relations between content and the individual exposed to it can be fully expressed within the limited and arbitrary confines of pencil and paper testing techniques.... Testing procedures may yield very useful information, but it is important to remember that the problem of the psychological impact of motion pictures is not solved by these devices alone (Fearing, 1950, pp. 102-03).

But after that caveat, he proceeds to ignore the limitations and interpret the results of his studies, as if they could measure the impact of films on viewers.

Twyford and Seitz, psychologists, do not discuss these limitations, and, gradually, we observe the erasure in the literature of the flaws of the experimental model. It becomes inscribed in the discourse as the appropriate model; it has been made official by military research. It may be said that the before-and-after design, using film as a stimulus, which was developed by Peterson and Thurstone (1933) for their part of the Payne Studies, grew into the true experimental design that still resides at the heart of educational technology research. The manner in which this model became in-

scribed is rhetorical and similar to the way the discourse on behavioral learning theory developed. Early in the century, when someone asked Watson how he would account for emotions within his stimulus-response model, he replied that emotions were distal variables that he and other behaviorists would address later, but, currently, he wished to study molar variables. Well, the distal variables fell out of the discourse and were never considered (or considered by a few as drives) when behaviorism dominated psychology (Becker, 1977).

The emphasis on experimentation can be seen in the contents of the Fearing (1950) book.

The Twyford and Seitz (1956) military technical report is bound in the same official-looking black-and-gold format as described before and makes good use of charts and diagrams. The variables studied tend to be similar to those employed in WWII film research, i.e., retention of learning, effectiveness, novelty, and screen size. It was strange that this particular set of instructional television findings were ignored by the initiators of instructional television in the 50s and 60s (Becker, 1987). These reports, which were sponsored by the Human Engineering Department of the U.S. Naval Training Device Center but conducted in the Psychology Department at Fordham University, have an early application of the flow-chart in the audiovisual field. Seitz was head of the Navy's Human Engineering Department, which may have appropriated concepts such as flow diagrams from the Navy's work on programmed machine language in the mid40s (see Fig. 1-15). And the human engineering field was the area in which the systems concept was established (Encyclopedia of Computers, Science and Technology, Vol. 7, p. 429).

In both this and the Fearing text, we see an early use of the word subject to designate study participant, but here the word is never used to designate topic of study.

1.10.7 See and Hear

The audiovisual contingent returning from war duty organized an important journal, See and Hear. Although there had been journals in visual education before See and Hear, they had not been established by a group of educational technology founders. Walter Whittich recalls it's beginnings:

I thought it would be a great idea now that the field was growing, and the war years were over-everybody was very enthusiastic-to gather up all this tremendous talent that had been developing in the training aids group. Such men as Noel and Bernardis and Jim Brown, oh, gosh, you know, that whole gang that came back from the war. I prevailed again upon my very good friend, John Guy [Fowlkes] to use his influence with a local businessman.... He ran Eau Claire Book and Stationary Company. And he had a printing press up there.... It was possible to gather together about 25 of these returned audiovisual buffs from the war (about 1946) and get them together and committed to the idea of starting a magazine that was a real forward-looking outreach and struck across the whole spread of education. Each would bring to it at least one article a year on his own innermost and most constructive thoughts. And this became See and Near (Whittich, n.d.).

This journal represented an effort to get media formally adopted in the classroom. Audiences included not only teachers and librarians but school administrators and legislators as well. In the statement of purpose of Vol. 1, No. 1, the editors, Walter Wittich, C. I. Anderson, and John Guy Fowlkes say:

We are well past the time when we should formulate plans for audiovisual education in terms of free materials. Audiovisual communication via good teaching equipment is here. It is here to stay as a working part of our classroom environment.

We, therefore, have passed beyond the point of emergency appropriations, PTA gifts, service club sponsorship, scrap-paper drives, and other precarious policies of financing audiovisual education. Now that audiovisual materials must become an integral part of teaching techniques, more solid budget provision must be made. Only insofar as audiovisual materials enjoy a budgetary status comparable to that which other school equipment enjoys can the program of audiovisual learning approach full effectiveness. Isn't it, then, high time that we also examine the financial cost of a well-coordinated program of audiovisual education in our schools and make necessary budgetary provisions for it?

<p>I. INTRODUCTION</p> <ul style="list-style-type: none"> Use and limitations of psychological evaluation procedures Other investigations The present investigation The tests Groups tested <p>II. "THREE CADETS"</p> <ul style="list-style-type: none"> The film Content analysis Specific references Thematic ambiguities The subjects Characteristics of group Information on venereal disease The tests Attitude scales Information test Validity and reliability of information test Administration of tests Analysis of results of information test Frequency distribution of test scores Responses on individual test items Individual items on which shift is slight Responses as related to average for group Items showing greatest change Summary of results Responses on attitude scales Attitudes on which change is slight Attitudes on which change is large Summary of responses Overall evaluation of film by subjects
--

Figure 1-14. Table of contents from Motion Pictures as a Medium of Instruction: An Experimental Analysis of the Effects of Two Films, 1950, Berkeley, University of California Press, v-vi.

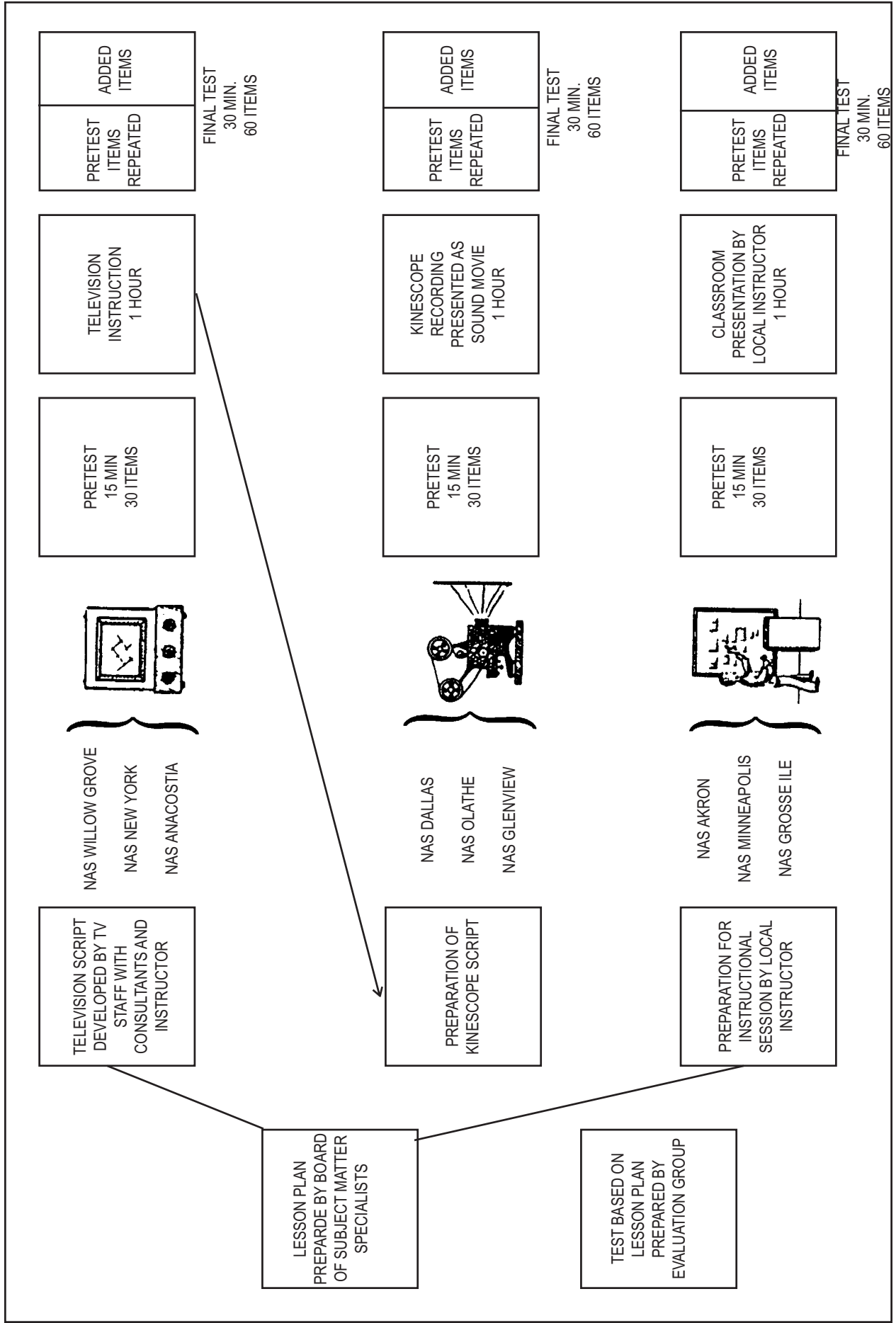


Figure 1-15. Flowchart, by Twilyford and Seitz, 1956, p. 2.

These are the purposes of See and Hear (Wlittich, Anderson, Fawlkes, See and Hear, Vol. I, No. 1). These founders were attempting to move the audiovisual field from the periphery in classrooms to the center by establishing formal links with funders, i.e., legislators private sector funders. Even at the classroom level, the area-to become professional-had to have alliances with government and business.

1.10.7.1. McClusky: While See and Hear was growing, there was a flurry of scholarly audiovisual activity. An AV pioneer, who had been writing since the 20s, published a helpful bibliography for the field in 1950, with a second edition in 1955 (McClusky, *The A-V Bibliography*, 1955). See Figure 1-16. The size and style of the book is similar to the military reports of media research released during and after WWII. An 8 1/2by- 11 -inch format is covered in gray with maroon lettering; the book looks official. In the second edition, a condensed table of contents with graphics appears before the full table of contents.

The condensed table is similar to many tables in children’s dictionarys and reference books of the time, and one used in some military training manuals. The full table of contents divides the field into the same categories as do the summary books and textbooks of the 30s and 40s. But even in the 1955 edition, McClusky-now at UCLA and, perhaps, with Frank Fearing who never uses the term audiovisual-still uses the term audiovisual and the initials A-V. An interesting feature of this text and one that is important here, since we are exploring the formation of the academic field, is a listing of audiovisual doctoral dissertations completed in the late 40s and earlier. Two points are of interest here: the work of leaders and future chairs of Instructional Technology (IT) departments and the universities supporting AV research before the formation of IT departments. See Figure 1-17.

1.10.8 The Nebraska Study

In 1952, Wes Meierhenry published the final report on the “Nebraska Program of Educational Enrichment Through the Use of Motion Pictures” (Meierhenry, 1952). This had been a Carnegiefunded study and one of the first large, major educational media studies funded by private-sector money. It foreshadows the multimillion-dollar investment of the Ford Foundation just a few years later. (The Ford Foundation attempted to jump-start the diffusion of instructional television in public school classrooms.) The Nebraska statewide effort to introduce film in the public schools was based on the following premise:

During and after World war 11, reports from exservicemen and educators who served in the educational program of the Armed Forces showed that a wide variety of instructional materials, particularly motion pictures, had been found effective in the training of members of the Armed Forces.... The use of materials by the Armed Forces gave new impetus and direction to their general use (Meierhenry,1952, p.11). In a chapter entitled, “Planning for Action,” Meierhenry reviews several decades of experimentation with

educational film, citing Wood and Freeman, and Knowleton and rllton in the 20s; Rulon, Dale, and Arnspiger in the 30s; Carpenter, Whittich, Hoban, Jr., and Hovland, Lumsdaine and Scheff~eld in the 40s. Again, we see the 50s authors leaning on the substantial but limited (in number) work of a small circle of AV researchers. Gone again are any direct references to learning theories from the table of contents and the body of the text.

I.	The Philosophy and Psychology of Teaching with Audio-Visual Materials
II.	Audio-Visual Teaching Materials and Their Use
III.	Elementary Schcols
IV.	Secondary Schools
V.	Higher Education
VI.	Administration of Audio-Visual Instruction
VII.	Research on Value and Utilization of AudioVisual Materials
VIII.	Miscellaneous

Figure 1-16. First table of contents from *The A-V Bibliography*, 1955, by F. McClusky, Dubuque, Iowa, Wm. C. Brown.

We conclude that tacit theoretical assumptions underpinning the Nebraska experiments are behavioral. Project members conducted state-of-the-art educational research in Nebraska public schools over a period of several years. Five of the book’s chapters (V, VI, VII, VIII, and XIII) are based on doctoral dissertations conducted under the auspices of this project (see Fig. 1-18). Those aspects of students’ learning from film are evident in the subheads of one of those chapters, “Motion Pictures Enrich Learning,” based on Guy Scott’s doctoral dissertation (Meierhenry, 1952, pp. 55-71). They are:

- Experimental Design
- Reliability of Film Tests
- Statistical Procedure
- Test Results for the First Experimental Period
- Composite Test Results for Two Years
- Tests Results for Retention
- Summary of Test Results in the Science Area
- Summary of Test Results in the Social Studies Area
- Summary of Test Results in the Convocation Area
- Summary of Tests Results on Retention
- Conclusions

On the 16 pages of the chapter, there are 11 tables, lmost one per page, and the chapter concludes with these zaragraphs:

In general, film groups and control groups learned about the same content as measured by standardized tests, and the film groups learned significantly more of the material presented by the films. It is possible to devote an amount of time at least equal to that used in this experiment for instruction by means of motion pictures and maintain a level of

Chapter I	Planning for Action
Chapter II	Launching the State-Wide Plan
Chapter III	Providing the Instructional Materials
Chapter IV	Motion Pictures Enter the Classroom
Chapter V	Motion Pictures Enrich Learning
Chapter VI	Motion Pictures Enrich Learning(Continued)
Chapter VII	Motion Pictures Modify Beliefs
Chapter VIII	Motion Pictures Influence Educational Achievement
Chapter IX	Motion Pictures, Intelligence, and Enrichment
Chapter X	Four Years of Working Together at the State Level
Chapter XI	Four Years of Working Together at the Higher Educational Level
Chapter XII	Four Years of Working Together in a Cooperating Secondary School
Chapter XIII	A State-wide Program
Chapter XIV	Planning for the Future

Figure 1-18. Table of contents from *Enriching the Curriculum Through Motion Pictures*, by W. Meierhenry, 1952, Lincoln, University of Nebraska Press.

The tacit assumption here is that variables can be isolated and controlled, and that careful measurement can locate cognitive gains in students. According to appropriate guidelines for the conduct of research at that time, there was no discussion of the students who were subjects in the studies. Even in the chapter “Motion Pictures Modify Beliefs,” in which dissertator Jack Peterson quantifies student response (Meierhenry, 1952, pp. 88-134), there is no heading for students. The headings do include:

- Administration of the Pretests
- Administrations of the Post Test
- Method of Scoring the Belief Scale

This action of ignoring the students does not reflect on the doctoral candidates in the project, or their major professors. They were, in fact, following rigorous methods for the conduct of scientific study, but the influence of the social efficiency movement and its concomitant learning and measurement theories are, by now, firmly inscribed in the dominant discourse running through educational technology, and it is, unfortunately, a narrow discourse. (There is not much use of the word subject, which is actually an interchangeable part, to indicate students here. Most often the authors use the terms, experimental or control groups and the word student.)

On the last page of the text, however, Meierhenry, for the first time, exposes his beliefs about media and learning:

Throughout the history of civilization there have been

great teachers who have contributed much to the practice of teaching. Such men as Erasmus, Comenius, Pestalozzi, Rousseau, Froebel, and Dewey called attention to the sterility of many learning situations and urged the correction of these situations through the use of more concrete experiences. To provide concrete experiences out of which may develop meaningful concepts, generalizations, and principles is the main purpose for using audio-visual materials in education. When teachers understand more adequately than they do now, the essential elements for learning to take place in the complex human organism, when they understand more adequately the kinds of experiences necessary to produce desired changes in behavior, when they use more skillfully a variety of instruments and devices to discover whether the desired changes in behavior have taken place, at that time a happier, more satisfying, and more worthwhile educational experience will await the girls and boys in the schools of Nebraska. The Nebraska Program of Educational Enrichment Through the Use of Motion Pictures has helped to open the door to this new educational era (Meierhenry, 1952, p. 228).

This is an interesting statement, because the author cites a list of child-centered educators, in fact the very educators cited by many AV writers in the 40s. But, in the second paragraph, he switches back to the black-box theory of stimuli power to change behavior. It is as if his desire to help teachers and children breaks through the reductive epistemology that shackles the field at this moment in time.

1.10.9 Applied Texts in the 1950s

In the 50s, there was a new interest in the publication of audiovisual texts for the study of the field and the application of media in classrooms. Three of the texts had a wide distribution and are of interest to us here: A-V Instruction, Materials and Methods, Audio-Visual Materials and Techniques, and Audio-Visual Materials: Their Nature and Use. It is interesting to note that the field was officially still termed audiovisual, even though the war researchers were shying away from that title in their research publications. The paradox, however, was that most of these 50s education textbooks were authored by men who had participated, in or out of the services, in the writing of military training manuals. But for the first time, these books offered education professors and teachers in training a choice in selecting textbooks. Obviously, the market for these books in colleges of education existed, because major publishers, such as McGraw-Hill and Harper and Brothers joined the enterprise.

It is rare that we have an author of an important textbook talking about the manner in which the first edition was conceived and written, but Walter Wittich spoke frankly about *Audio-Visual Materials: Their Nature and Use*:

Well, the first edition was on the market in 1953, which was the culmination of 5 years of classroom tryout in the extension classes throughout Wisconsin, Northern Illinois, and the middle of Minnesota.

The book is the book because of the very wonderful working relationship that Charlie Schuller and I enjoyed in

1953 and still enjoy now.

[Charlie] came into the audiovisual department [University of Wisconsin] as my associate.... We began working very strenuously together on organizing extension classes in audiovisual throughout the state. In 1948, for example, we had 24 extension classes running simultaneously throughout the state of Wisconsin. There were six of us teaching those. One time we were using Edgar Dale and his very remarkable book. Due to a series of circumstances, we decided that we ought to try one of our own, so we began developing the materials" (Wifflich, n.d.).

Schuller also talks about how the first edition of *Audiovisual Materials; Their Nature and Use* came about:

It came about through accident, outside influence, and so on. John Guy Fowlkes had gotten a contract with Harper and Bros. by which he got a certain percentage out of generating needed books in the field-like a 1% royalty on all books produced, and he had a "Century in Education" series which was well conceived and well designed. Old John Guy came to us one day and said, "Well, you know I don't know of any real books in this field." He had heard of Edgar Dale's book and the impact it had. And he said, "Don't you think it would be a good idea if we put one up?" Neither Walt and I- although we had done some writing- were all that hot about writing a book, but the combination of our innate interest and John Guy's pushing created that first thing. And it was twice as much work as we had ever anticipated, maybe 3 or 4 times. And I doubt very much if we would have got into it, if not for that little accidental association. John Guy, of course, was both our major professors (Schuller, 1978).

Today, educational technology practitioners are often so focused on the details of academic life that the necessary political work on behalf of students and machines is accomplished by amateurs outside the field. That was not the case in the early years. Consider the work that I. Keith Tyler and the Institute for Education by Radio and Television (IERT) did to get public television channels reserved for education:

One thing that happened at the Institute [for Education by Radio and Television, IERT, at Ohio State] was that this became the place for the commissioners from the Federal Communications Commission to come out and get educated about the educational side of broadcasting. They saw commercial broadcasters all the time, but educators, in those days, didn't have money to have lawyers to appear before the commission.... And so those who really took the public interest seriously used to come to the institute just to see what was being talked about and what was going on.... And if a new commissioner came on, they'd say, "Go out to Columbus and see what's going on." And so a new commissioner, a lawyer from the east side of New York who was very cause minded . . . Frieda Hennock, came out to the institute and was very impressed . . . and she said to herself "this is my cause." I am going to make this a cause (Tyler, 1977).

The FCC had put a freeze on the development of new television stations in 1948, until research about their positioning and operations could be assembled and presented to

the commissioners. Originally, it was a 1-year freeze that was extended until 1952. Tyler and others mounted a case for the reserving of television stations for the exclusive use of education. It is an important moment, because it was the start of public television. His story is colorful:

. . . Let's see if we can . . . ask permission to come to the FCC while the freeze is on and insist, in their new allocation, that they reserve channels for education. So we had a meeting in the fall of 1950, and the NAEB (National Association for Educational Broadcasting) was represented, I . . . represented . . . the University [Ohio State] or the Institute [ERT], and the Office Of Education [was represented]. I would say there were about 12 of us, maybe 15. And the general idea . . . [was] we'd have to dig it out of our own universities or public school systems' pockets for the expenses.

. . . Frieda Hennock was there, the commissioner, and she said "This was a great cause, and we ought to do something about it" (Tyler, 1977).

Tyler relates that Hennock directed him to make a formal effort for the official FCC hearings on the allotment of channels in the fall of 1952. He chaired the effort, and Hennock recommended that his educational group be represented by an attorney:

And Frieda Hennock . . . said, "Why don't you go for General Telford Taylor?" And we said, "Who is he?" And she said that he was the chief prosecutor of the Nuremberg Trials for the Army. And before that he was the chief counsel for the Federal Communications Commission, and he really knows his way around, and he's with this very dedicated [to social causes] law firm on Wall Street (Tyler, 1977).

Taylor agreed, and they went about the business of assembling witnesses.

And so we had Democrats and Republicans; we had senators and representatives; we had AAUW; we had the PTA; we had labor; we had manufacturers (Tyler, 1977).

1.10.10 And They Were Successful

There remains a tendency today to say "Well, things are so complicated, we (educational technology scholars) could have little or no influence on the national scene." And the national scene, with the proliferation of computers in the classroom and the threat from the private sector of proprietary schools, needs our input. In the 60s and 70s, many scholars were trained with monies from the National Defense Education Act, and there was an expectation that this funding would continue. Even though it did not, the field became entrenched in the academy, and there was less need for scholars to be political in the manner of the founders. As we nodded, we became shut out of national educational technology politics. One interpretation of this situation could be that only early innovators are politically effective. Another, although not separate, is that some aspects of national politics were anathema to the securing of tenure.

The rhetoric of the founders and those who follow indicate that the basis of this field will always be hardware, with its concomitant marketplace and governmental interests. If we turn away from this, our voices will remain within the academy. We will be talking to ourselves. Whatever tempering influence we could have will be lost. Our founders presented us with a good model of action.

1.1 1 CONCLUSION

That which is valued by the cognoscenti and the practitioners of a field is expressed in the rhetoric of their writing and speech. Such rhetoric inscribes those definitions, concepts, and theories that they value. That these important terms are based on values, and not on some constant nor objective reality, is uncovered in history, because one can see the manner in which they are always changing and always contingent on prevailing beliefs.

The progenitors of this field conducting ground-breaking research in the 20s were naturally caught up in the refinement of educational studies by the introduction of connectionism and social efficiency principles. These two discourses permeated the social science literature of the decade—a decade of heavy immigration, a decade of expanding wealth. Methods for dealing with these social situations created by the 20s were being suggested by the prevalent discourses, particularly that of social efficiency. Film studies gained stature by joining the dominant discourses. Authority for film studies, and ultimately for the audiovisual field, however, became conflated with governmental and corporate offices.

That humanistic, Deweyesque discourses became ascendant in education, as well as in audiovisual education from the mid-30s, and was also culturally and historically contingent. The 30s was a period in which the common person was valorized and governmental agencies mistrusted (note Hollywood cinema and popular novels of the period). Social efficiency ideas, which were hierarchical and sought to control populations, became a subtext to humanism during this period. The experience and opinions of students and teachers entered the audiovisual discourse, and a multiplicity of voices were heard.

The field of educational technology, however, as we know it today, garnered rhetorical currency and a berth in the academy with the discourses represented in World War II research, operant conditioning, and military training. That which is valued by scholars is always contingent on cultural norms, and these norms influence theory as well as practice in a field. One of the things that was valued in World War II was the preservation of democracy, and many projects were conflated with that desire. Unfortunately, the methods for accomplishing that preservation at that moment in time were undemocratic, i.e., hierarchical and militaristic. Democratic desires had informed the enterprise of public education just prior to World War II (Apple, 1993). Perhaps audiovisual educators,

imbued with democratic values, noted the efficiency and effectiveness of military pedagogy operating particularly in the service of the preservation of democracy, and were convinced that education should proceed down the same road.

Nonetheless, a field was established in which many of us have careers. By any measure, the founders were successful.

Walter Wittich is cognizant of this fact:

I just want to say this, that any person who goes through a professional experience and is able to get something done, and is able to have people pay some attention to it, I think is very fortunate. And I consider myself extremely fortunate (Wittich, n.d.).

1.12 THE WOMEN'S STORIES

Within this chapter, we have focused on those people recognized as most prominent historically in the field of educational technology. However, another group of people worked with the field as well, also aspiring to bring educational technology into the mainstream of the educational environment. These are the women of educational technology, and here are some of their stories....

1.12.1 Introduction

Audiovisual education and ultimately educational technology was permanently inscribed in schools and training institutions because of its presence in World War II. A small group of men did not allow the World War II years, that specific moment in time when there was a powerful confluence of theory, pedagogy, and technology, to go unnoted.

Charles F. Hoban, Jr., James Finn, Walter A. Wittich, Charles F. Schuller, Kenneth Norberg, Edgar Dale, Lee Cochran, Amo DeBernardis, Frances Noel, John Guy Fowlkes, William Johnson, W. W. Charters, and Robert Gagne, these and other names represented the growth and development of educational technology preceding, during, and after World War II. In the eclectic Division of AudioVisual Instruction of the 30s that was peopled by teachers, artists, librarians, filmmakers, principals, and others, women's names were present in the rolls of leaders. The military adventure, however, was almost exclusively male, and audiovisual women were present only as helpmates. Gerda Lerner's insight applies to this era:

Women have been the one group in history longest excluded from political power, and they have, by and large, been excluded from military decision-making" (Lerner, 1979, p. 154). The position of women in the academic realms of educational technology after WWII was no different from the position of women in other educational fields, such as educational psychology. Historically, although women in audiovisual education played major roles, they were often overlooked and/or assigned minor ones. Therefore, we will

inform you about some of these prominent women and answer this question: What contributions did women make to the development of the field of educational technology before, during, and after WWII?

1.12.2 Oral and Written Histories

In the 1950s and early 60s, the Archives Committee of the National Education Association, Department of AudioVisual Instruction, sponsored a series of oral history interviews with audiovisual pioneers in the United States. Recorded on reel-to-reel audiotapes, the interviews follow similar formats. Although no prepared lists of questions have been found for these interviews, all conform to a similar style, taking the interviewee through his or her early days in the visual and/or audiovisual field and into the present 50s and early 60s. Questions asked include: "Didn't you dispute the very term visual education?" (Aughinbaugh, 1954); "Well now, just how far back does your interest in visual education go?" (McClusky, 1955); "How far back do you trace your interests in the motion picture?" (Milliken, 1954); and "As a former student of yours, I was always impressed with your ability to relate audiovisual materials to all levels of instruction. What factors or experiences have contributed to this ability?" (Wittich, 1959).

In all, seven interviews are available from this series: Rita Hocheimer, retired acting director of the Bureau of Visual Instruction of the Board of Education, City of New York (1955); B.A. Aughinbaugh, retired head of the Slide and Film Exchange of the Ohio State Education Department (1954); Ellsworth Dent, vice-president of Coronet Films (1961); F. Dean McClusky, professor of education and head of Audio-Visual Education and Extension, UCLA (1955); Bruce Mahan, retired dean of the State University of Iowa Extension Division (1961); Carl E. Milliken, head of Teaching Films Custodian Incorporated (1954); and Walter A. Wittich, professor of education at the University of Wisconsin-Madison (1959).

Additionally, in the mid- to late 1970s, the Educational Communications and Technology Foundation (ECT), which is part of the Association of Educational Communications and Technology (AECT), supported an oral history project. Young educational technologists interviewed and taped leaders from the early days of the formation of the field. An interview schedule was prepared to provide structure to the sessions, but both interviewers and interviewees strayed from the prepared list. The audiotapes consequently are quite rich. Some of the prepared questions were: What sorts of media/materials were predominant in the period prior to World War II? Who were some of the "big names" in the AV field at that time? What were some sources of professional information-textbooks, journals, etc.? Prepared questions concerned with World War II included: What was the name of your (military) position? Principal duties? Was military utilization of training films usually exemplary? Is it true that many of our

current practices in film utilization were developed via military research and practice? Post-World War II questions included: Do you know of individuals who received their principal introduction to the media field in the military and later entered school or college AV work after the war? Who were some prominent names in ETV at that time?

The tapes of 1 woman and 12 men were available. Among those interviewed were Elizabeth Golterman, formerly of the St. Louis, Missouri, city school system (1976); Floyd Brooker, former director of the Division of Visual Aids for War Training of the U.S. Office of Education during the World War II years (1975); James W. Brown, San Jose State University (n.d.); Edgar Lee Dale, retired from Ohio State University (1977); C. Louis Forsdale, Teachers' College, Columbia University (1979); L. C. Larson, retired from Indiana University (1977); F. Dean McClusky, former school administrator and director of the Department of Visual Instruction (1980); Kenneth Norberg, retired professor of education at California State University in Sacramento, California (1977); Mendel Sherman, Indiana University (1976); Charles F. Schuller, retired director of the Instructional Media Center at Michigan State University (1978); Warren Stevens, Indiana University (1977); I. Keith Tyler, Ohio State University (1977); and Walt Wittich, professor emeritus at the University of Hawaii (n.d.).

The interviewees were immersed in the culture of their era: pre-World War II, the war years, and post-World War II, and were prominent, in the field of educational technology, over a wide time span, from approximately the 1930s through the 1960s. Social, political, and economic forces of these decades influenced the founders' attitudes, actions, and concerns about men and women and educational technology; women's equity in the workplace was not yet a focus of attention. In some cases, the comments of these founders reflected the position of women in the larger society; in other cases, they recognized and made space for the contributions of women to the formation of the field.

Additionally, we obtained information on early women in the field from a variety of reference books, educational technology textbooks, early audiovisual periodicals, DVI (Department of Visual Instruction, National Education Association) and DAVI (Department of Audio-Visual Instruction, National Education Association) publications, and other print sources.

1.12.3 Women in the Workplace During and After WWII

Although World War II did not revolutionize gender and race relations, it provided many more women, in industry and the military, with high-paid and skilled employment. While World War II was a "milestone" for American women in terms of career and employment, the 1950s found these same women fighting discrimination and sex segregation. Jobs they held during the war were often taken by men com-

ing home. Housework was glamorized in magazines and finally television; women were ambivalent about losing their paid employment (Hewitt, 1990; Baxandall, 1976). The 50s, a period of apathy for many women, were also a time of general malaise in many parts of the U.S. educational community-until 1957. (Sputnik's launch in 1957 encouraged Americans across the nation to support improvement of the nation's education, especially in science, languages, counseling, and media services. Federal funds became available and audiovisual materials were introduced into the curriculum [Hopkins & Butler, 1991]). Women's ambivalence, as the "second sex," was captured during the following decade. The advent of the 1960s found many U.S. women in turmoil; an ideological shift highlighting their equity encouraged women to again work outside the home (Davies, 1974). Within educational technology, these decades were a period of growth for all involved in the profession. When viewed through women's eyes, these decades raise as many questions as they do answers.

1.12.4 Prominent Women: Oral Histories

1.12.3.1. Rita Hocheimer: A former president of the Department of Visual Instruction of the National Education Association and retired assistant director of visual instruction for the New York City Public Schools, Rita Hocheimer was one of the "old-timers" in the field of audiovisual instruction (Golterman, 1976; Lembo, 1970). Interviewed by Alfred E. Devereux, president of IBA House, Inc., Hocheimer states on the audiotape that she began teaching at Washington Irving High School in New York City in 1913. When World War I broke out, she went to France: "In those days, there was no USO. I asked for leave from the school system, which was granted. During the next few months, I lived with various units of the United States Army... we opened a lemonade stand. This was much appreciated by the men..." (Hocheimer, 1955). Hocheimer returned to the United States in 1918. Because of her work with slides and films, as well as her knowledge of French and German, she was assigned part-time to the New York City Schools' Bureau of Visual Instruction and part-time as a language teacher. Within a short period, she became a full-time employee of the Bureau and "... began going from school to school actually giving lessons in auditoriums on a weekly schedule" (Hocheimer, 1955). The films she used were commercial ones that she could obtain only by picking them up at 5 a.m. after theaters were through with them. Hocheimer continued in the Bureau of Visual Instruction in New York City, eventually becoming assistant director, a position she held for 25 years. For 20 of those years, she was also acting director. During this 25-year stint, she was active in a number of audiovisual organizations including: the Academy of Visual Instruction, the New York Metropolitan Visual Instruction Association, and DAVI. People she worked closely with in the audiovisual field included: F. Dean McClusky, Grace Ramsey, and Irene Cypher. Hocheimer's expertise in the field of audiovisual materials was-in her own words- films, first silent and

then also sound. Although retired from the New York City schools, Hocheimer was teaching a class in motion picture appreciation at New York University's New School at the time of her interview (Hocheimer, 1955).

1.12.3.2. Elizabeth Golterman: Elizabeth Golterman was one of two females, according to the AECT archives, interviewed during the ECT Oral History Project. She was also the only nonacademic in the group. (She and Professor L. C. Larson were the only two interviewees without Ph.D.s.) Involved in early audiovisual services for the St. Louis, Missouri, city school district, Golterman began in the St. Louis Audiovisual Center (a department specializing in audiovisual materials within the St. Louis school system) in 1930, and always viewed herself as a teacher first and an audiovisual person second. More than any other interviewees of the Oral History Project, Golterman named early women in the profession: Amelia Meissner, Alma Rogers, Lelia Trolinger, Camilla Best, Wanda Daniels, Margaret Devizia, Helen Rachford, Caroline Guss, Anna Hyer, Mickie Bloodworth, Emily Jones, Rita Hocheimer, Etta Schneider, and Bea Harding, among others. Her interviewer asked her how it felt to be a woman in a male-dominated profession:

Interviewer: "Certainly as a young woman in education, and I hope my male chauvinism doesn't show too much by asking the question. How did you relate to the early administrators who were probably in the mainstream, at the upper level, male? And how do you anticipate the feminist movement for the future?"

Golterman: "Well, I think . . . I certainly didn't feel we were part of any feminist movement back in the 30s when I began here. It is true that our staff had begun as a staff that was headed by a woman and staffed by women, and it continued this. I think largely, because we always had sought outstanding teachers of certain kinds. And the teachers in the St. Louis School System at that period were women teachers, except in the high schools.... my answer is that we tried to know our job. We cared a great deal for the teachers, and for the boys and girls, and I think that was the important thing, whether we were men or whether we were women. May I say, I am grateful and think that it is long overdue, to be recognizing some of the blocks that traditionally women have had in many fields. But fortunately, in St. Louis, I think that we had recognition, and we had good support as a department that was staffed by women. And there were some fine ones. I think that it was a privilege to have worked with Amelia Meissner; then the next generation of our associates that included teachers like Nelly Jenkinson, Dorothy Blackwell, Margery Fleming, Gertrude Hofstan, Harriet Bick. These were people that were tops. And I think that the department grew with them and through them" (Golterman, 1976).

Golterman's interviewer also asked her several other questions of interest to the subject of women in the profession:

Interviewer: "What are some names that you can recall from your experience-women nationally-that have made

contributions to education, specifically media?"

Golterman: 'Well, Cal, when you told me that the most recent AECT convention had had over 9,000 people, I thought back to the days when NEA Audiovisual Department was really held together by just a few loyal people, and when the first meeting I ever attended in St. Louis at the time of an NEA superintendents' meeting, mid-winter meeting, they met in our building. And I don't believe that there could have been more than 40 or 50 people there. In those early years, that I remember it, I think that it was held together by Lelia Trolinger from the University of Colorado; by Camilla Best, who was the New Orleans audiovisual head; by people like the elder Charles Hoban from the state of Pennsylvania; supported by a young Ohio State University man, Edgar Dale....

" . . . Let me run down some of the women that I have had memories and associations with, certainly Miss Trolinger and Miss Best. Wanda Daniels up in Grosse Point, I think was one of the fine ones. Margaret Devizia in Los Angeles; Helen Rachford in Los Angeles County, who was killed in that tragic plane crash on her way to an audiovisual convention up in Minneapolis; Caroline Guss at the University of Indiana; at NEA, Anna Hyer and Mickie Bloodworth; Emily Jones at FWA; Rita Hocheimerr was one of the really old-timers. She headed up the services in New York, when first I came into this picture. Etta Schneider, and then the people here in our own area. Alma Rogers, certainly, and the members of our staff I think I've mentioned.... "

1.12.3.3. Margaret Devizia: " . . . now I appeared in the doorway and I didn't know anyone and it was kind of new to me and I felt a little bit shy about the whole thing, because it was mainly run by men and they were sitting around in the chairs in this room and draped over the furniture and having a smoke and a relaxing time and they looked up and one of them saw me in the door and he said to his friend, 'Get up off of that, that's the best chair in the room for God's sake. She's the representative from Los Angeles. She's got the biggest budget in the country' " (Devizia, 1979).

Interviewed in 1979 as part of the ECT Foundation Oral History Project, Margaret Devizia is probably best known as the first female audiovisual specialist in the military during World War II. Devizia began, in the 1930s, as an elementary school teacher in the Los Angeles City Schools, later becoming an audiovisual coordinator for the system. With the advent of World War II, she was approached by Francis Noel who had joined the Navy to direct an audiovisual services unit. Noel asked her to join this unit:

Devizia: " . . . the War came along and Francis Noel, who was in Santa Barbara, was invited by the Navy to come into the Navy to become an audiovisual . . . and I was invited by Francis to join that unit, and I was the only woman. There were 120 people, 120 men in the unit, and I was the only woman in the unit!"

Interviewer: "Where was the unit stationed?"

Devizia: "I went to Washington. Well, first of all, I went to Smith College for six weeks of training, and then I was

sent to Washington for another six weeks of training . . . in the central unit there with Francis and the captain of training, and then I was allowed, which was almost unheard of, I was allowed to choose the place where I would work. Since they had only one woman, and some of them didn't know what in the world to do with her in a man's Navy and a man's world, really. I was asked . . . where I would like to go, so I was sent on a trip to a number of cities and was allowed to choose from that trip where I worked. So I decided to go to New York to work, because the captain of training in New York was very enthusiastic about having WAVEs, and that was not always true in the beginning when WAVEs were . . . first inducted into the Navy. So then I went to New York... I had charge of the land schools in New Jersey and Connecticut and New York... I was (the) audiovisuals materials officer. (In addition to the men's schools), I always had the women's training schools. We provided the (audiovisual) material" (Devizia, 1979).

After the war, Devizia returned to Los Angeles and the school audiovisual field. Eventually, she became head of the audiovisual section for the Los Angeles Public Schools and designed and operated a new citywide instructional materials center, which opened in 1962. Both before and after the Second World War, she was active in various audiovisual organizations at the state and national levels. (Elizabeth Golterman spoke of the fact that in early DAVI, she was the only woman until Margaret Devizia came into the picture [Golterman, 1976]). Devizia's strongest media interests were in the realms of educational film and television. "We had so much hope for television. We went into it with so much enthusiasm on the part of everyone as I said" (Devizia, 1979). At the end of her interview, Devizia's interviewer asked her to "... look into the future a little bit and predict some things or make some observations (about what in AV) we still have to look forward to" (Devizia, 1979). Devizia's reply was: "That'll be the day!" (Devizia, 1979).

1.12.4 Prominent Women: Written Histories

Even though little is recorded about women in educational technology, they played a significant role in the establishment of the field, particularly in the years surrounding World War II. Nine prominent women whose careers are recorded elsewhere are Amelia Meissner, Anna Verona Dorris, Etta Schneider, Fannie Dunn, Elizabeth (Betty) Noel, Helen Rachford, Frieda Hennock, Anna Hyer, and Carolyn Guss.

1.12.4.1. Amelia Meissner: Mentioned by Elizabeth Golterman as one of the people who most influenced her in educational technology, Amelia Meissner began the St. Louis School Audiovisual Center in 1904. At that time, it was called the "Educational Museum." The Educational Museum was a result of the Louisiana Purchase Exposition of 1904 (Ile World's Fair). St. Louis school superintendent, Dr. Soldan, appropriated \$1,000.00-a large sum of money at that time-to purchase exhibits from the fair to be kept in St. Louis and used by teachers and students in the public schools. The subsequent large collection of realia was housed in one room

and the corridors of one of the city schools, and Meissner, a former upper-grade teacher, was placed in charge of it. She was chosen by Soldan because of a shared hobby in photography (the two had first met on a train and later on a tour of Germany). In 1905, Meissner compiled the first printed catalog of visual materials. It was composed of object collections, sets of lantern slides and stereoscopic view sets. Golterman considers Meissner to be the first audiovisual pioneer in the United States (Golterman, 1976).

1.12.4.2. Anna Verona Dorris: Paul Saetler in *The Evolution of American Educational Technology* first mentions Dorris in a listing of early visual education bureaus in American city schools. He states that she was the director of visual instruction in Berkeley in 1922. Saettler later places her (also in 1922) at San Francisco State College, where she surveyed provisions made for teacher education across the nation in visual instruction. Dorris is also documented as having developed one of the earliest visual instruction course outlines and having written a book (published in 1928) entitled, *Visual Instruction in the Public Schools* (Saettler, 1990, pp. 137, 149, 153, 166). This text, along with an earlier book of Dorris's: *Visual Instruction: Course of Study for the Elementary Schools, Including the Kindergarten and First Six Grades* (1923), was documented and referenced by almost every other published visual or audiovisual textbook author through the 50s. Both are considered benchmarks in the field. In addition to this information, *Leaders in Education* (1941) places Dorris as president of the Department of Visual Instruction of the National Education Association (NEA) from 1927 to 1929.

1.12.4.3. Etta Schneider: We found very little biographical information on Etta Schneider (of Teachers College, Columbia University), other than the fact that she, along with Edgar Dale, Charles, F. Hoban, Jr., and Fannie Dunn (also of Teachers College), wrote the 1937 book, *Motion Pictures in Education: A Summary of the Literature: Source Book for Teachers and Administrators*. This text consists of nonevaluative summaries of articles and books written about educational films. According to its foreword, Schneider was involved in "... the bibliographical compilation, digesting and editing of a large amount of the material contained in this volume . . ." (Dale et al., 1937, 5). Schneider is mentioned by Golterman as one of the prominent women in the field (Golterman, 1976).

1.12.4.4. Fannie Dunn: Fannie Dunn was one of the co-authors of *Motion Pictures in Education: A Summary of the Literature: Source Book for Teachers and Administrators*. Along with Etta Schneider, she compiled and wrote three sections of the book: the administration of visual aids, teaching with the motion picture and other visual aids, and teacher preparation in visual education (Dale et al., 1937, pp. 7-8). Like Dorris's books, *Motion Pictures in Education* was often referenced in educational technology books through the 50s.

1.12.4.5. Elizabeth Goudy (Betty) Noel: Another early woman pioneer in educational technology was Elizabeth Goudy (Betty) Noel. One of (Elizabeth) Noel's publications (coauthored with J. Paul Leonard), *Foundations for Teacher Education in Audio-Visual Instruction* (published in 1947), she describes as a "... guide for administrators and instructors in colleges and universities planning to include work in audiovisual education in their preservice and in-service teacher education program, and for administrators, supervisors, and directors of audiovisual departments in local school systems in planning in-service education programs" (Noel, 1947, p. iv). Here Noel refers to audiovisual education as

"... the carefully planned and integrated use of a wide range of teaching materials from the kindergarten through college . . . [which] includes the use of field trips or excursions, sound and silent motion pictures, television, objects, models, specimens, dioramas, slides, filmstrips, stereographs, study prints, posters, radio programs, recordings, maps, the bulletin board.

Instruction was improved by the use of these materials, she said, and by "life experiences which supplement and clarify the printed word" (Noel, 1947, p. 1). (This supports the life adjustment curriculum discussed previously in this chapter.) Although Noel's husband, Francis, is more well known in educational technology circles, this publication shows that Beny also influenced the field. As with other branches of education, educational technology textbooks were important for both college students and practitioners.

1.12.4.6. Helen Rachford: A former president of the Audiovisual Association of California and of the Film Council of America, Helen Rachford, was also active in DAVI and AECT (she was to assume the vice presidential office at the time of her death), and in several California educational and library organizations. Rachford, a contemporary of Margaret Devizia's (see above), was the Los Angeles County Schools director of the division of Audio-Visual Education. She was killed in a plane crash on her way to the 1958 AECT convention. The AECT Memorial Scholarship Fund, formerly the Helen Rachford Memorial Scholarship Fund, was established in her honor that same year.

1.12.4.7. Frieda Hennock: As first female member of the Federal Communications Commission (she was appointed by President Harry S. Truman in 1948), Frieda Hennock "... had a vision of a national educational television system and played a significant role in the movement toward educational television" (Saettler, 1990, p. 388). Although at first she knew little about broadcasting, Hennock learned rapidly, and was the only FCC commissioner in 1949 to protest the fact that no portion of the television spectrum had been set aside for education. Later, Hennock would be the one to suggest to I. Keith Tyler and Belmont Farley that they retain General Telford Taylor, chief prosecutor of the Nuremberg Trials, as lawyer in their quest to reserve television channels for education [see above] (Tyler, 1977). "She

... became a kind of Joan of Arc, leading the campaign to reserve television channels for noncommercial educational use ... [and] ... she had a good relationship with [President] Harry Truman, which was helpful as well” (Robertson, 1993, pp. 61, 63).

1.12.4.8. Anna Hyer: Considered by Charles Schuller as “One of the great women in our business” (Schuller, 1978), Hyer is probably best noted as executive secretary of DAVI in the mid50s. Before her tenure at DAVI (post-World War II), she served as assistant in administration at Indiana University under L. C. Larson. Later, she went to Syracuse, where she “... became involved in the international arena” (Larson, 1977). When DAVI ceased being a part of the National Education Association (NEA), Hyer left DAVI and continued working for NEA. In 1977 she was awarded the AECT Distinguished Service Award in recognition of her contributions to the field (Larson, 1977).

1.12.4.9. Carolyn Guss: Carolyn Guss, according to various volumes of *Who’s Who in American Education*, was (1960s) a professor of education at Indiana University in Bloomington, Indiana, where she taught administration of media and research. She was also active in the Audiovisual Department of NEA and various other audiovisual organizations, holding several administrative posts within these groups. In addition, she is one of the authors of the 1961 book *Guide to Newer Educational Media*.

1.13 CONCLUSION

A couple of decades after World War II, women in educational technology, as well as in other fields, rebelled against the “feminine mystique” and sought to gain equity in existing political, social, and economic structures in the United States. Although women in educational technology became more prominent, the placement of women in this field is still uneven today, as is the position of women in other areas of the academy, such as educational administration. The women mentioned above are just a few of the female contributors to the field of educational technology. There are others. Today, women continue working towards equal recognition, opportunity, and responsibility within educational technology.

REFERENCES

- Apple, M.W. (1993). *Official knowledge: democratic education in a conservative age*. New York: Routledge.
- (1986). *Teachers and texts: a political economy of class and gender relations in education*. New York: Routledge & Kegan Paul.
- Arnsperger, V.C. In E. Dale, F. W. Dunn, C. F. Hoban Jr. & E. Schneider (1937). *Motion pictures in education: a summary of the literature: source book for teachers and administrators*, 336. New York: Wilson.
- Baxandall, R., Gordon, L. & Reverby, S. (1976). *America’s working women*. New York: Vintage.
- Becker, A. (1977). *Alternate methodologies for instructional methods research*. *Audiovisual Communication Review*, Summer, 181-94.
- Becker, A. (1987). *Instructional television and the talking Head*. *Educational Technology*, Oct.,35-40.
- Bell, R., Cain, L., Lamaroeaux, L., et al. (1942). *Motion pictures in a modern curriculum, a report of the use of films in the Santa Barbara Schools*. Washington, DC: American Council on Education.
- Benjamin, W. (1968). *Illuminations*. New York: Harcourt, Brace.
- Borradori, G. (1994). *The American philosopher*. Chicago, IL; University of Chicago Press.
- Bove, P. (1992). *Mastering discourse*. Durham, NC: Duke University Press.
- Brooker, F. (1975, Apr). Interview.
- & Herrington, E. (1942). *Students make motion pictures, a report on film production in the Denver public schools*. Washington, DC: American Council on Education.
- Brown, J., Lewis, R. & Harcleroad, F. (1959). *A-V instruction, materials and methods*. New York: McGraw-Hill.
- (n.d.) Interview with Ron McBeth.
- Brubacher, J. & Rudy, W. (1968). *Higher education in transition*. New York: Harper & Row.
- Bureau of Naval Personnel (1947). *Photography*, Vol. 1. Washington, DC: United States Government Printing Office.
- (1947). *Photography*, Vol. 2. Washington, DC: United States Government Printing Office.
- Cattell, J.M., Cattell, J. & Ross, E. E. (1941). *Leaders in education: a biographical directory*. New York: Science Press.
- Chambers, M. (1948). *Opinions on gains for American education from wartime armed services training*. Washington, DC: American Council on Education.
- Clark, R.E. & Salamon, G. (1986). *Media in teaching*. In M.C. Wittrock, ed. *The third handbook of research on teaching*, 468. Chicago, IL: Macmillan.
- Cochran, B. (1942). *Films on war and American policy* Washington, DC: American Council on Education.
- Consitt, F. (1937). In E. Dale, F.W. Dunn, C.F. Hoban Jr. & E. Schneider (1937). *Motion pictures in education: a summary of the literature: source book for teachers and administrators*, 309. New York: Wilson.
- Cook, R.C. & McDuff, M. (196&). *Who’s who in American education*. Hattiesburg, MS: *Who’s Who in American Education*.

- Curtis, B. (1992). True government by choice men?: inspection, education, and state formation in Canada west. Toronto: University of Toronto Press.
- Dale, E.L. (1977, Mar.). Interview with John C. Belland.
- (1946). Audio-visual methods in teaching. New York: Dryden.
- F.W. Dunn, C.F. Hoban Jr. & E. Schneider (1937). Motion pictures in education: a summary of the literature: source book for teachers and administrators. New York: Wilson.
- Davies, M. (1974). Woman's place is at the typewriter. Cambridge, UK: Radical America.
- DeVaney, A. (1990). Rules of evidence. *Journal of Thought* 25 (172), 6-1.
- Devereux, F. (1933). The educational talking picture Chicago, IL: University of Chicago Press.
- ECT Foundation. (1993). 1994 AECT Memorial Scholarships Information Paper. Washington, DC: ECT Foundation.
- Fearing, F. (1950). Motion pictures as a medium of instruction; an experimental analysis of the effects of two films. Berkeley, CA: University of California Press.
- Fenton, W.N. (1947). Area studies in American universities. Washington, DC: American Council on Education.
- Forsdale, C.L. (1979, May). Interview with Bill Hugg.
- Foucault, M. (1977). Discipline and punish: the birth of the prison. New York: Pantheon.
- Frauens, M. (1948). Improving textbooks the army and navy way. Washington, DC: American Council on Education.
- Freeman, F., ed. (1924). Visual education: a comparative study of motion pictures and other methods of instruction. Chicago, IL: University of Chicago Press.
- Freeman, F.N., E.H. Reeder & J.A. Thomas (1924). An experiment to study the effectiveness of a motion picture film which consists largely of tables, maps, and charts as a means of teaching facts or giving abstract information. In F. Freeman et al. Visual education: a comparative study of motion pictures and other methods of instruction, 258-74. Chicago, IL: University of Chicago Press.
- (1922). Research versus propaganda in visual education. *Journal of Educational Psychology* 13 (5), 257-46.
- Gagne, R. & Briggs, L. (1965). The conditions of learning. New York: Rinehart & Winston.
- Garce, A., et al. (1947). Educational lessons from wartime training. Washington, DC: American Council on Education.
- Gluck, S.B. (1987). Rosie the riveter revisited Boston, MA: Twayne.
- Golterman, E. (1976, May). Interview with Calvin Owens.
- Goodman, S. (1948). Curriculum implications of armed services training. Washington, DC: American Council on Education.
- Guthrie, E.R. (1950). The psychology, v of human conflict: the clash of motives within the individual. New York: Smith.
- Hewitt, N.A. (1990). Women, families,, and communities. Glenview, IL: Scott, Foresman/Little, Brown Higher Education.
- Hilgard, E.R. (1948). Unconscious processes and man's rationality. Urbana, IL.
- Hoban, Jr., C. (1942). Focus on learning. Washington DC: American Council on Education, Committee on Motion Pictures in Education.
- & vanOrmer, E. (1951). Instructional film research 1918-1950 (Technical Report No. SDC 269-7-29). Port Washington, NY: Department of Commerce, Office of Technical Services, Special Devices Center.
- Hopkins, D.M. & Butler, R.P. (1991). The federal roles in support of school library media centers. Chicago, IL: American Library Association.
- Hoveland, C., Lumsdaine, A. & Sheffield. (1949). Experiments on mass communication. Princeton, NJ: Princeton University Press.
- Hull, C. (1928). Aptitude testing. Yonkers on the Hudson, New York: World Book.
- Kinder, J. (1950). Audio-visual materials and techniques. New York: American Book.
- Kliebard, H.M. (1987). The struggle for the American curriculum 1893-1958. New York: Routledge.
- Knowlton, D. & Tilton, J. (1929). Motion pictures in history teaching. New Haven, CT: Yale University Press.
- Koon, C. (1934). Motion pictures in education in the United States, a report compiled for the International Congress of Educational and Instructional Cinematography. Chicago, IL: University of Chicago Press.
- Lacy, J. (1919). The relative value of motion pictures as an educational agency. *Teachers College Record* 20, 452-45.
- Larson, O. (1977). Interview with Bob Heinich.
- Lerner, G. (1979). The majority finds its past: placing women in history. New York: Oxford University Press.
- McClusky, F.D. (1924). Comparisons of different methods of visual instruction, and comparisons of six modes of presentation of the subject matter contained in a film on the iron and steel industry and one on lumbering in the north woods. In N. Freeman et al. Visual Education. Chicago, IL: University of Chicago Press.
- (1950). The A-V bibliography. Dubuque: Brown.
- (1955). The A-V bibliography (rev. ed.). Dubuque, IA: Brown.
- (1980). Interview with Bob Heinich.
- (1931). Visual instruction: its value and need New York: Mancall.

- McKown, H.C. & Roberts, A.B. (1949). Audio-visual aids to instruction. New York: McGraw-Hill.
- Mailloux, S. (1989). Rhetorical power. Ithaca, NY: Cornell University Press.
- Meierhenry, W.C. (1952). Enriching the curriculum through motion pictures. Lincoln, NE: University of Nebraska Press.
- Mertz, N.T. & S.R. McNeely, (1990). Getting to be a professor of educational administration: a study of how females "got" the job. Boston, MA: American Educational Research Association.
- Miles, J. R., & C.R. Spain, (1947). Audio-visual aids in the armed services. Washington, DC: American Council on Education.
- Miller, N. & J. Dollard, (1941). Social learning and imitation. New Haven, CT: Yale University Press.
- et al. (1957). Graphic communication and the crisis in education. AVCR, 1-120.
- Morrison, T. (1992). Playing in the dark. Cambridge, MA: Harvard University Press.
- Motion Picture Project with the assistance of the Pan American Union (1942). The other Americas through films and records. Washington, DC: American Council on Education.
- National Society for the Study of Education (1949). The forty-eighth yearbook: part 1: audio-visual materials of instruction. Chicago, IL: University of Chicago Press.
- (1960). New teaching aids for the American classroom. Palo Alto, CA: Stanford University, Institute for Communication Research.
- Nichols, B. (1981). Ideology and the image: social representation in the cinema and other media. Bloomington, IN: Indiana University Press.
- Noel, E.G. & Leonard, J.P. (1947). Foundations for teacher education in audio-visual instruction. Washington, DC: American Council On Education Studies.
- Noel, F. (1942). Projecting motion pictures in the classroom. Washington, DC: American Council on Education.
- Norberg, K. (1977, Apr.). Interview with Charles I. Vento.
- Perkinson, H.J. (1968). The imperfect panacea: American faith in education, 1865-1965. New York: Random House.
- Peterson, R. & Thurstone, L. (1933). Motion pictures and the social attitudes of children. New York: Macmillan.
- Pounder, D. (1988). Male/female salary disparity for professors of educational administration. New Orleans, LA: American Educational Research Association.
- Rooney, E. (1989). Seductive reasoning. Ithaca, NY: Cornell University Press.
- Rulon, I. (1933). The sound motion picture in science teaching. Cambridge, MA: Harvard University Press.
- Saettler, L.P. (1990). The evolution of American educational technology. Englewood, NJ: Libraries Unlimited,
- Schuller, C.F. (1978, Feb.). Interview with Don Ely. See and Hear 1, (1).
- (1942). Selected educational motion pictures: a descriptive encyclopedia. Washington, DC: American Council on Education.
- Sherrnan, M. (1976, Oct.). Interview with Michael Molenda.
- Short, P.M., et al. (1989). Women professors of educational administration: a profile and salient issues. San Francisco, CA: American Educational Research Association.
- Smith, B. (1942). In H.M. Kliebard (1987). The struggle for the American curriculum 1893-1958, 240. New York: Routledge.
- (1942). The War and the educational program. Curriculum Journal 13, 113-16.
- Staff of the Tower Hill School (1942). A school uses motion pictures. Washington, DC: American Council on Education.
- Stevens, W. (1977, Feb.). Interview with Michael Molenda.
- Sumstine, D. (1918). A comparative study of visual instruction in the high school. School and Society 7, 235-38.
- Symposium on the State of Research in Instructional Television and Tutorial Machines. (1959). New teaching aids for the American classroom. Stanford, CA: Institute for Communication Research, Stanford University.
- Taylor, F.W. (1911). The principles of scientific management. New York: Harper & Brothers.
- Thorndike, E. (1910). The contribution of psychology to education. Journal of Educational Psychology I (1), 5-12.
- Thurstone, L. & Peterson, R. (1933). Motion pictures and the social attitudes of children. New York: Macmillan.
- Turkle, S. (1984). The good war.
- Tuttle, W.M. (1993). Daddy's gone to war: the Second World War in the lives of America's children. New York: Oxford University Press.
- Twyford, L. & C. Seitz (1956). Instructional television research reports. Port Washington, NY: U.S. Naval Training Device Center.
- Tyler, K. (1977, Jun.). Interview with John Belland.
- Vandermeer, A. (1954). Color and black and white in instructional films. Audio-Visual Communication Review 2 (2), 121-34.
- Weaver, G.G. & E.W. Bollinger (1949). Visual aids: their construction and use. New York: Van Nostrand.
- Weber, J.J. (1922). Comparative effectiveness of some visual aids

in seventh grade instruction: the educational screen.

-(1930). Visual aids in education. Valparaiso, IN: Valparaiso University.

Westfall, L. (1937) E. Dale, F.W. Dunn, C.F. Hoban Jr. & E. Schneider (1937). Motion pictures in education: a summary of the literature: source book for teachers and administrators, 336. New York: Wilson.

Wise, H. (1939). Motion pictures as an aid in teaching American history in the senior high school. New Haven, CT: Yale University Press.

Wittich, W. (n.d.) Interview with Lillian Lum.

-& Schuller, C. (1953). Audio-visual materials: their nature and use. New York: Harper & Brothers.

Wood, B. & Freeman, F. (1929) Motion pictures in the classroom. Boston, MA: Houghton Mifflin.

Voices of the founders: Early discourses in educational technology Handbook of research for educational communications and technology. A. DeVaney. Oral history in the secondary school classroom. The 4th edition of the Handbook of Research on Educational Communications and Technology expands upon the previous 3 versions, providing a comprehensive update on research pertaining to new and emerging educational technologies. Chapters that are no longer pertinent have been eliminated in this edition, with most chapters being completely rewritten, expanded, and updated. Additionally, new chapters pertaining to research methodologies in educational technology have been added due to expressed reader interest.