

The Good, the Bad, and the Ugly: A Bibliographic Essay on the Corrupted Cone

Deepak Prem Subramony

Grand Valley State University

Michael Molenda

Indiana University

Anthony K. Betrus

State University of New York at Potsdam

Will Thalheimer

Work-Learning Research, Inc.

The authors are attempting to set the record straight regarding the sources frequently cited in the literature of the mythical retention chart and the corrupted Dale's Cone. They point out citations that do not actually connect with relevant works; provide correct citations of sources that are often cited erroneously; add references for overlooked works; and examine the stories and works of individuals involved in this controversy. Among the people discussed are: Edgar Dale and the team of Hoban, Hoban, and Zisman, who contributed the original concepts of the Cone of Experience; Frank Dwyer, Paul J. Phillips, and D. G. Treichler, who played roles in popularizing the mythical retention chart; Bruce R. Nyland and James E. Stice, who helped conflate the retention chart with Dale's Cone; as well as Ray Wiman and Wes Meierhenry and William Glasser, innocent bystanders who have been dragged in erroneously.

Objective

One of the problems in the discourse about the mythical retention chart and corrupted Dale's Cone is the prevalence of false or incorrect attributions of the chart or the cone. These fallacious references have been passed along, being cited by one writer after another, apparently without ever being checked against the supposed original sources.

Occasionally writers cite real works by their actual authors, but the works do not contain the information that is claimed. More often either the author's name or the publication information is incorrect. We hypoth-

esize that writers are more likely to succumb to the temptation to use a dubious source if they don't know the person, are not familiar with their role in the profession, or they believe the readers are also unfamiliar with them. A disembodied name is easier to misuse.

The main article in this special issue, "The Mythical Retention Chart and the Corruption of Dale's Cone of Experience" debunks the false claims that have been made about the various versions of the "cone of learning." This article focuses on putting some flesh on the bones of the people cited, rightly or wrongly, correctly or incorrectly, in the literature surrounding the mythical retention chart and corrupted Dale's Cone.

Having some accurate information about the person might help readers evaluate the credibility of a citation. At the very least, this listing will clarify the full names—correctly spelled—and affiliations of the various players.

We also provide correct citations for works that are relevant to this discussion, adding annotations about the contents of these works—which have sometimes been distorted by those citing these works, probably without examining them.

This bibliography is based on a careful examination of the texts of each of the works cited. The authors have held these books and journals in their hands! The entries are verified as correct, aside from possible quibbles about style.

Edgar Dale

By far, the name most frequently linked to the "cone of learning" is that of Edgar Dale—see *Exhibits 3, 4, 5, and 10*.^{*} And this linkage is actually partly justified, unlike many of the other names bandied about. Dale was a prolific scholar, and one of his intellectual products was the Cone of Experience, devised as an organizational schema for his 1946 textbook (*Figure 2*)[†] and slightly revised for the 1954 edition (*Figure 3*). Clearly, the many versions of the "cone of learning" are based on his original schema.

However, other than the conical outline with a number of horizontal divisions, there is little residue of Dale's original Cone of Experience in the "cone of learning" so widely disseminated over the past couple of decades (*Figures 10–16*).

* As explained in the *Introduction*, all of the 13 Exhibits referenced in the articles comprising this special issue are placed together in a separate, dedicated section of this issue rather than being dispersed across the issue.

† As explained in the *Introduction*, all of the 16 Figures referenced in the articles comprising this special issue are placed together in a separate, dedicated section of this issue rather than being dispersed across the issue.

Who Is Edgar Dale?

Edgar E. Dale (1900–1985) was a research professor at Ohio State University and a widely respected scholar in the field of education. He grew up in North Dakota, taking BA and MA degrees at the University of North Dakota. After serving as a teacher and principal, he completed a PhD at the University of Chicago in Education in 1928, becoming a research associate in the Bureau of Educational Research at Ohio State University in 1929, where he remained until his retirement in 1970. During World War II, Dale worked in the Bureau of Motion Pictures, Office of War Information and consulted on the development of training films in Hollywood. By that time he was already a widely published and renowned scholar in the educational applications of mass media and had served as president of the most prominent professional association in that field, the Department of Visual Instruction (DVI) in 1937–1938.

At midcentury, having written a celebrated textbook on audiovisual methods in teaching (Dale, 1946; subsequent editions in 1954, 1969), he was among the best known authorities in the field of audiovisual education. His “Cone of Experience,” introduced in the first edition of his textbook, was intended only as a framework for organizing the chapters of the book. At no point in time did Dale ever claim his Cone was a rigorous taxonomy, nor that the categories were based on research, nor did he ever associate ANY numbers with his categorization schema.

Dale was well known internationally for his studies of children’s vocabulary and the development of literacy programs. He was a US representative to UNESCO 1947–1951 and served on numerous boards in educational broadcasting and educational film. In 1935 he began a four-page publication known simply as *The News Letter*, which he continued to produce eight times a year until his retirement in 1970. *The News Letter* carried snippets of news related to education, mass media, literacy, and popular culture and usually a provocative essay by Dale (e.g., “Why Listen to Music?” “What Does It Mean, to Read?” and “Not by Arms Alone”). It was distributed gratis to a mailing list of followers that grew to over 25,000, and many leaders in educational media relied on it for its foresight and breadth of view. He received many awards and honors, including the first Educational Film Library Association award (1961), the Eastman Kodak Gold Medal (1968), and the Distinguished Service Award of the Association for Educational Communications and Technology (AECT) in 1972.

What Did Edgar Dale Write?

During his professional career Edgar Dale published dozens of influential articles, several books on films in education and children’s vocabulary development,

and three editions of his classic textbook on the use of audiovisual media in teaching:

- Dale, E. (1946). *Audio-visual methods in teaching*. New York: The Dryden Press. This is the first edition of Edgar Dale’s classic textbook on using audio-visual resources effectively in teaching. The “Cone of Experience” makes its first appearance here and it serves as the organizing principle for the chapters of the book.
- Dale, E. (1954). *Audio-visual methods in teaching* (revised edition). New York: A Holt-Dryden Book, Henry Holt and Company. This is the second edition of Edgar Dale’s classic textbook. By this time, television had become commonplace in homes, and the first public television station has gone on the air in 1953, necessitating the addition of a chapter on television and the inclusion of television in the Cone of Experience. By this time Dale had completed landmark research in readability, co-developing the standard instrument for measuring the readability of text in 1948.
- Dale, E. (1969). *Audiovisual methods in teaching* (3rd edition). New York: The Dryden Press; Holt, Rinehart, and Winston. Edgar Dale’s book, by the late 1960s, had significant competition as a college textbook, but the publisher put a third—and last—edition on the market. There are no significant changes to the Cone of Experience visual schema from the second edition. Dale retired as a faculty member at Ohio State University in 1970, living until 1985. At no time, in any edition, did Dale add any sort of percentages to the Cone of Experience.
- Dale, E. (1946/1996). The cone of experience. In D. P. Ely and T. Plomp (Eds.), *Classic writings on instructional technology* (pp. 169–182). Englewood, CO: Libraries Unlimited. The “Cone of Experience” chapter, excerpted from the first edition of Dale’s audio-visual textbook, is selected as one of the foundational writings for the field of instructional technology.

As is reiterated throughout this special issue, in none of his works did Dale ever mention or allude to any percentage figures regarding the retention of material presented in various media formats. On the contrary, as an expert in statistical analysis (particularly regarding children’s vocabulary development), he was always cautious about limiting any statistical claims with painstaking care.

Hoban, Hoban, and Zisman

The next authors—Charles Hoban junior and senior and Samuel Zisman—are not people whose names are mistakenly cited in the “cone of learning” literature; rather, they are absent from that literature, even though

they are arguably the intellectual fathers of the “cone” concept.

Who Is Charles F. Hoban?

Charles F. Hoban (1873–1948) was an early leader in the visual education movement and the father of and collaborator with Charles F. Hoban, Jr., on the influential textbook, *Visualizing the Curriculum* (Hoban, Hoban, & Zisman, 1937). The senior Hoban worked as a teacher and school superintendent in western Pennsylvania, attaining AB, MA, and PhD degrees from nearby Grove City College. By 1924 he was a staff member at the Pennsylvania Department of Public Instruction and by 1934 was director of the state museum and visual education program. Hoban served as president of the Department of Visual Instruction (DVI), predecessor of AECT, in 1931–1932. Because of his prominence as an advocate for the use of films in education, he was commissioned to lead a project to create a national film institute in the 1930s.

Who Is Charles F. Hoban, Jr.?

Charles F. Hoban, Jr. (1906–1977), the son of Charles F. Hoban, was a prominent scholar and author on visual education. He grew up in Harrisburg, PA and received his PhD from Ohio State University under Edgar Dale. In the late 1930s he was selected to lead a long-term project to promote the use of films in education. This work was interrupted by service during World War II as chief of film distribution and utilization for the Army Pictorial Service. Throughout the postwar period, on the faculty at the University of Pennsylvania, he was prominent as a scholar on communication theory and the systems approach to the development of mediated instruction, while he continued to promote the use of motion pictures in education.

Who Is Samuel B. Zisman?

Samuel Bernard Zisman (1908–1970) was a distinguished architect and planning consultant who spent most of his professional career in private practice in San Antonio, TX. He obtained a degree from MIT in 1930 and taught drawing in the Department of Architecture at MIT 1930–1935, later joining the faculty at Texas A&M University until the advent of World War II. During the war he was a Technical Sergeant in the Army Air Force, teaching camouflage techniques, and he later directed post-war rebuilding efforts in Bavaria. Back in the US in 1947, Zisman became director of city planning in Philadelphia. From his private practice in San Antonio, he consulted far and wide on urban planning throughout the US and in Europe, Africa, and Latin America.

What Did Hoban, Hoban, and Zisman Write?

Charles Hoban, Sr., was more of an administrator

and advocate than an author. Hoban, Jr., though, was a prolific writer, mainly on films and education. In the 1930s and 1940s he authored or co-authored five books related to integrating motion pictures into school and college curricula. With Edward B. van Ormer, he compiled *Instructional Film Research, 1919–1950*, an encyclopedic summary of military research on instructional uses of films from World War I through World War II (Hoban & van Ormer, 1950). He was called upon again in 1971 to revisit this subject with *The State of the Art of Instructional Films* (1971). Zisman wrote four books and many articles and reports, mainly on visual design, architecture, and urban planning. Hoban, Hoban, and Zisman together co-authored one book:

- Hoban, C. F., Hoban, C. F., Jr., & Zisman, S. B. (1937). *Visualizing the curriculum*. New York: The Cordon Company. One of the earliest, best, comprehensive textbooks on all types of visual media, with psychologically based recommendations for integration of materials into lessons and curricula, based on insights of a psychologist, an administrator of educational media, and a visual media producer.

This book was significant to the “cone of learning” discussion because it introduced a schematic diagram (similar to our *Figure 1*) which is uncaptioned but accompanied by this text:

The relative effectiveness of the various visual aids is in direct ratio to the pupil's stage of learning and development. This principle is illustrated in the following diagram. (p. 23)

That is, when learners have a lot of prior first-hand experience with a concept, they can understand more abstract presentations; when they lack that prior experience, they need more concrete learning activities. This concrete-to-abstract progression is later emulated by Dale as the organizing concept of his Cone of Experience.

Frank Dwyer

Another authentic scholar whose name occurs in the discussion of the mythical retention chart is Frank Dwyer. Although he has long been an outspoken critic of the fallacious data in the retention chart, one of his books probably accelerated the chart's dissemination.

Who Is Frank Dwyer?

Francis M. “Frank” Dwyer (b. 1937) has conducted hundreds of research studies in visual learning as a professor at Pennsylvania State University. Beginning as a high school science teacher with a BS in secondary education and an MS in instructional technology from Massachusetts State College-North Adams, he

went on to complete an EdD in Educational Administration at Pennsylvania State University in 1964, at which time he joined the faculty there, continuing until his retirement in 2007. In 1965 he began a unique long-term program of systematic research on the variables related to learning from visuals, the Program of Systematic Evaluation. This program yielded more than 300 research articles and 250 conference presentations in addition to providing invaluable collaborative opportunities for hundreds of graduate students. He developed and taught more than a dozen graduate courses on instructional design, research methods, and distance education. His many accolades include serving as president of the International Visual Literacy Association, 1978–1979 and of AECT, 1984–1985.

What Did Frank Dwyer Write?

During his 43 years as a professor at Penn State, Dwyer authored more than 300 research articles related to visual learning and instructional design, many arising out of his systematic program of experiments using standard materials. He has authored several books summarizing the findings of these studies; the first (Dwyer 1972) provided the outline of his systematic program and presented the findings of the first five years of research. His overall conclusion, contrary to easy generalizations about retention of visual material, is that:

...the effectiveness of visualized instruction is dependent upon the type of visual used, the method of cueing students to the essential learning cues, relevant student characteristics, the method selected for presenting the visualized instruction, and the type of educational objective to be achieved. (p. 94)

Two later books (Dwyer 1978, 1987) provided updates of findings as further research accumulated in his Program of Systematic Evaluation; in addition, he co-edited a major anthology on visual literacy (Moore & Dwyer, 1994). However, the book that has most bearing on the discussion of the mythical retention chart is his second:

- Dwyer, F. M. (1978). *Strategies for improving visual learning*. State College, PA: Learning Services. This is a scholarly survey of the state of knowledge about human learning from visuals as of 1978. It focuses on the author's systematic program of research at Pennsylvania State University using a standardized set of materials to study variables such as pacing, color, cueing, individual learner differences, and aptitude-treatment interaction, as well as issues in visual testing. Dwyer begins with a critique of naïve formulations about the value of visuals in facilitating

learning and he uses Treichler's retention chart as an example. He states that this chart "presents data distributed by the Socony-Vacuum Oil Company" (p. 8) and gives Treichler 1967 as a reference. Dwyer clearly intends to dismiss this naïve formulation, but still, Dwyer provides us with one of the few instances of the bogus data appearing in a scholarly book.

This book appears to be the source of both the "Socony-Vacuum" attribution and the version of the retention chart that became more or less standard in the years after 1978 (see *Figure 5*). It is highly unlikely that the many purveyors of the mythical retention chart of the 1990s and 2000s encountered this specific formulation via the original Treichler 1967 article. It is more likely that they found it in Dwyer's book, a book that had a deserved reputation for scientific credibility. The fact that Dwyer used it as a negative example either was misunderstood or ignored.

All of Dwyer's works consistently question the "realism" theory—the more realistic the experience, the more educationally effective it is—and seek to understand the factors that actually improve or impede student learning from visual presentations. In recent years Dwyer has been prominent in the chorus of educational technology authorities who have debunked the claims of the mythical retention chart and the corrupted cone (Dwyer, 2010), as is discussed at greater length in "Previous Attempts to Debunk the Mythical Retention Chart and Corrupted Dale's Cone."

Wiman and Meierhenry

As shown by *Exhibit 12*, the names "Wiman and Mierhenry [sic]" are often alluded to as possible sources for the mythical retention chart embedded in the "cone of learning." Like Dale and Dwyer, these are the names of actual scholars in educational media. However, neither of them ever wrote about retention rates or cones of learning.

Who Are Ray Wiman and Wes Meierhenry?

Raymond V. Wiman (1925–1991) had a long career on the faculty of Education at the University of Iowa, teaching and directing the graduate program in educational media. He received a BA from Arizona State University and an MA from San Francisco State College. After years of teaching at the elementary and secondary level, he attained the EdD degree at the University of Nebraska. His connection with the corrupted cone came as a result of his editing partnership with Wes Meierhenry (Wiman & Meierhenry, 1969).

Wesley C. Meierhenry (1915–1989) was a leading scholar in educational technology from the 1940s through the 1970s. He was a life-long Nebraskan, first a teacher, coach, and superintendent in public

schools, then a professor at the University of Nebraska after receiving his PhD there in 1946. He came to national fame as program administrator of the Nebraska Program of Educational Enrichment Through the Use of Motion Pictures, a four-year research project begun in 1946 to demonstrate how films could be integrated into the school curriculum. It involved hundreds of teachers in dozens of schools across Nebraska.

He worked in the extension division and the department of adult and continuing education as well as serving as assistant dean in the Teachers College at the University of Nebraska. He was unsurpassed as an analyst of new and emerging innovations in education—from film and correspondence study in the 1940s to educational television in the 1950s to programmed instruction in the 1960s to instructional theory in the 1970s. He served as president of the Department of Audio-Visual Instruction (DAVI), predecessor of AECT, in 1967–1968. An endowed chair at the University of Nebraska has been named in his honor.

What Did Ray Wiman and Wes Meierhenry Write?

Wiman was the author of a textbook and film series on audiovisual production (Wiman, 1972) and co-author of another on management of educational media service programs (Vlcek & Wiman, 1989); the latter was recognized as AECT's Publication of the Year. Meierhenry wrote dozens of influential articles, chapters, and monographs on innovations in educational technology in the 1940s through 1970s. Their one collaboration was as co-editors of *Educational Media: Theory into Practice* (1969), an anthology of commissioned chapters presenting new theoretical perspectives on the field that was then moving from audiovisual aids to a broader concern with the entire instructional system. (As part of their effort to promote application of instructional research, they specified that the book be printed with dark brown type on camel colored paper, based on recent research on readability.)

Neither Wiman nor Meierhenry ever wrote about retention formulas or about Dale's Cone of Experience, which by the time of their anthology was already "old news," having been in the literature since 1946. Their names are dragged into this discourse through an incorrect attribution of two different chapters that appeared in their anthology:

- Wiman, R. V., & Meierhenry, W. C. (Eds.). (1969). *Educational media: Theory into practice*. Columbus, OH: Charles E. Merrill Publishing. This interdisciplinary collection is meant to provide both theoretical and practical grounding to professional practice in the emerging field of instructional technology. Wiman and Meierhenry

provide the opening and closing chapters of the book, but neither chapter makes any reference to Dale's Cone, contrary to popular attribution.

Compare this citation with the erroneous attribution shown in *Exhibit 12*. Note the correct spelling of Wesley C. Meierhenry's name; virtually all perpetrators of this spurious citation spell it incorrectly. In addition, virtually all perpetrators also refer to "Wiman and Mierhenry" as authors, whereas they are editors of the book. In reality, two different contributors in the Wiman and Meierhenry anthology make passing reference to Dale's Cone—Randall Harrison and Donald K. Stewart:

- Harrison, R. (1969). Communication theory, in R. V. Wiman & W. C. Meierhenry (Eds.), *Educational media: Theory into practice*. Columbus, OH: Charles E. Merrill Publishing Company (pp. 59–92). On page 75 Harrison says "Edgar Dale's 'cone of experience' deals with the coding of information along an iconicity dimension." There is, properly, no mention of any percentage figures in connection with the cone.
- Stewart, D. K. (1969). A learning-systems concept as applied to courses in education and training, in R. V. Wiman & W. C. Meierhenry (Eds.), *Educational media: Theory into practice*. Columbus, OH: Charles E. Merrill Publishing Company (pp. 134–171). Stewart's chapter is about a systems approach to instructional design; in it, he advocates the design of learning environments that reproduce or simulate the conditions of on-the-job performance, and he ranks learning experiences into categories arranged pyramidally in his Figure 6–20 (p. 161). The accompanying narrative states "Figure 6–20 is, in a sense, a continuum ranging from abstract to concrete." Stewart's footnote to this sentence says "Based in part on Edgar Dale's 'Cone of Experience' as presented in his *Audio-visual methods in teaching*" (p. 160). This is one of two passing references to Dale's Cone in this book. It, of course, makes no mention of any percentages.

William Glasser

Some of those incorrectly identified as sources of the "cone of learning" have a connection so tenuous as to be virtually nonexistent. William Glasser (see *Exhibit 8*) falls into this category.

Who Is William Glasser?

Dr. William Glasser (1925–2013) was primarily a psychiatrist, advocating reality therapy, an alternative method of psychotherapy practiced by thousands internationally. He attended medical school at Case Western Reserve, took psychiatric training at the Veterans Administration Hospital in West Los Angeles

and UCLA (1954–1957), became board certified in 1961, and was in private practice from 1957 to 1986. He rejected Freudian theory and developed his own theory, based on choice theory and rooted in motivation.

What Did William Glasser Write?

Dr. Glasser's first popular book, *Reality Therapy* (1965), was a best-seller and became the foundation for a series of how-to books about resolving psychological problems by accepting responsibility for them. A 1969 sequel, *Schools Without Failure*, translates choice theory into a classroom model of team learning with emphasis on satisfaction and excitement. Glasser pursued the quest for educational reform with books in the 1990s on "quality schools" and "quality teachers." However, nowhere in these works did Glasser refer to or claim credit for any version of the mythical retention chart or the corrupted Dale's Cone. All attributions to him are simply bogus, despite the fact that the Website operated by his business expressed a willingness at one time to accept credit, as is shown in *Exhibit 8*.

Paul J. Phillips

Colonel Phillips, like the Hoban-Hoban-Zisman team, is not that visible in the literature of the mythical retention chart, but perhaps he ought to be. Some commentators believe he may be the person most responsible for formulating the canonical version of the retention chart (see *Figure 5*) and for popularizing its use among the American corporate training community.

Who Is Paul J. Phillips?

Paul John Phillips (1900–1950) spent the first part of his career as an instructor in automotive technology at Oklahoma A&M University, after receiving an MS degree in trade and industrial education at that institution. He then spent two summers—1939 and 1940—at the University of Texas Division of Extension, preparing manuals for oil field workers on internal combustion engines and pipeline compressors (Cyrus, 1963). He entered World War II (serving from 1940 to 1946) as a Reserve officer, and Captain (later Lieutenant Colonel). Phillips was assigned as director of the Training Methods Branch of the Army's Ordnance School at Aberdeen Proving Ground, in Maryland, based on his prior experience in vocational education. His duties were to "(1) train officer instructors in 'how to instruct,' (2) to inspect classes in the Ordnance School for the purpose of rating instructors, and (3) to prepare a 'Manual for Ordnance Instructors'" (United States Army, 1943, p. 85).

The history of the Ordnance School goes on to recount that Phillips's staff grew to include nine

instructors and a clerk-typist (p. 86). Phillips and his team developed a 30-hour course of "practical teaching procedures and techniques" and an accompanying manual. By March 1943 some 14,000 men had received training and some 850 inspections of instructors had been conducted (p. 89). There is no mention in this history of any organized program of research or of the addition of any specialized staff to carry out research, at least up to March 1943.

What Did Paul J. Phillips Write?

There are no publications by Col. Phillips to be found in the literature of education or training. After his discharge in October 1946, Col. Phillips returned to the University of Texas, where he continued with his previous work. Cyrus (1963) testifies that it was Phillips who provided the content of the retention chart incorporated in the Texas Extension Division's "passout sheet 'Some Training Principles,' TIM-151" before his untimely death in 1950. This handout had sketches added in 1955 and was apparently used for quite some time, possibly until the time of Cyrus's 1963 letter and beyond. Cyrus says the sheet is "used in 'Methods of Teaching' classes and other instructing situations." Given that Phillips had gained considerable stature as a "trainer of trainers" and that his organization continued to offer workshops for adult learners in the petroleum industry, it is entirely possible that his TIM-151 "passout sheet" got into the hands of many who turned around and used it in their own teaching. It is likely, therefore, that the modern American diffusion of the infamous retention chart gained momentum at the University of Texas in the post-war era.

The other question is the source of the data in the retention chart; is it based on gut feeling or on research-based findings? The history of the Ordnance School provides no evidence that Phillips was involved in systematic research, at least not between 1940 and 1943. Nor is there any claim in the historical record of the data coming from any research at an oil company or at the University of Texas.

On the other hand, Cyrus's letter (1963) reports "Upon his return to this office, January 1, 1947, I remember his describing the tremendous number of individuals trained during the war years and the control and *experiments in teaching done with controlled, selected, and managed groups* [emphasis added] in training at Ordnance School." It is conceivable that some sort of structured research was conducted between 1943 and 1946. However, we know that various formulations of the retention chart were in existence as folklore even before the World War II period, as is discussed at length in "The Mythical Retention Chart and the Corruption of Dale's Cone of Experience." Since the retention chart

does not refer specifically to any modern media, but only seeing and hearing, the formulation could have been ginned up at any point in history.

D. G. Treichler

There is one clearly established, published source of the canonical version of the mythical retention chart, shown in our *Figure 5*. It appeared in an article authored by D. G. Treichler in 1967.

Who Is D. G. Treichler?

DeForest Gordon "Treich" Treichler (1903–1970) served for many years as a training manager and advisor at Mobil Oil Corporation in New York City. He grew up in the Buffalo, NY area and joined Mobil in 1927 as a service station salesman. He had no formal education beyond the eighth grade, but obviously he was a man of great native ability, for he rose through the corporate ranks to organize Mobil's first full-scale audiovisual communication program in 1949 and to assist in the design of the company's model training center in 1956. Treichler was a stalwart in the corporate audiovisual community, frequently serving on planning committees and panel discussions, acting as an advocate for the use of audiovisual media in corporate communications.

What Did D. G. Treichler Write?

Treichler had only one known publication, composed at the end of his professional career, probably as a sort of valedictory:

- Treichler, D. G. (1967). Are you missing the boat in training aids? *Film and Audio-Visual Communication*, 1(14–16), pp. 29–30, 48. A broad ranging advocacy of the value of adopting modern visual media and using them based on current thinking from communication theory. Early in the article (p. 15) Treichler presents the infamous retention chart (it was his *Figure 5* and is substantially the same as our *Figure 5*); the accompanying narrative states:

Now what about retention? (See *Figure 5* for studies that indicate what people generally remember.) These figures, of course, are only approximate and subject to exceptions. However, they do indicate that the best way to persuade people to accept your ideas is through a well-illustrated visual aid presentation, especially one in which they participate." (p. 5)

Note that Treichler was not claiming originality for this chart, but he was claiming it was based on "studies"; by whom, he gives no indication. A bar graph later in the article, however, provides data about corporate audio-visual equipment use and is captioned "Socony-Mobil Oil Company, Inc." It is not surprising that some readers assumed that his reten-

tion chart was based on "studies" at that company (which they were not). On the title page, Treichler's affiliation is given as Mobil Oil Corporation, the successor to Socony-Mobil and Socony-Vacuum.

This is the earliest appearance we have found of the infamous retention data rendered into "chart" format in a published source, although the retention data clearly existed before 1967, since Treichler treats the information as so well-known that no attribution is needed. Clearly, Treichler did not create the retention data and did not claim to. As recounted in "The Mythical Retention Chart and the Corruption of Dale's Cone of Experience," various folkloric versions of the retention figures have been noted at least as far back as the early 1900s. And some version of the retention figures was being promulgated at the University of Texas extension division—Paul J. Phillips's work—since the late 1940s.

It must also be noted that at this point in time none of these authors were drawing any connection with Edgar Dale's Cone of Experience. These authors were not involved in, and were probably unaware of, the academic world of audiovisual education.

Treichler's article is the lead article in Volume 1, Number 1 of the new periodical, *Film and Audio-Visual Communication*, so it probably garnered special attention from corporate training readers, and might have lent credibility to the retention chart, aiding its acceptance among this audience. This article is the source used by Frank Dwyer to establish the "canonical" version of the retention chart. Even though Dwyer intended the chart as a negative example of the scientific knowledge base on learning and retention, Dwyer's mention gave the chart a degree of credibility.

Bruce R. Nyland

One of the more mysterious false attributions of the "cone of learning" is the one linking the corrupted cone with Edgar Dale and someone named Nyland (occasionally "Ryland"), as shown in *Exhibits 4* and *5*. The implication is that a person named Nyland, at some point in the life cycle of this myth, presented a visual showing some version of the mythical retention data overlaid on Dale's Cone of Experience. Both *Exhibit 4* and *Exhibit 5* mention the first name of Bruce to go with the last name of Nyland or Ryland. To the best of our investigative abilities, we have been able to identify one real-life person who is most likely to be the person referred to in these citations—Bruce R. Nyland.

Who Is Bruce R. Nyland?

Bruce R. Nyland (1938–1998) spent most of his career as a substance abuse counselor and educator to the civilian staff at Fort Eustis, Virginia. He studied

philosophy at Baldwin-Wallace College (AB) and Northwestern University (MA) and taught philosophy at the College of William and Mary in Williamsburg, Virginia from 1968 to 1971. He then served at Fort Eustis from 1972 until his death in 1998, directing the Fort Eustis alcohol and drug abuse prevention and control program. During those years he often spoke to professional and community groups about alcohol and substance abuse and smoking cessation. In 1994 he received an award for his advocacy work for the American Stop Smoking Intervention Study for Cancer Prevention (ASSIST).

What Did Bruce R. Nyland Write?

Up to now, no published works of Bruce R. Nyland have come to light. We speculate that at one or more of Nyland's professional presentations he handed out a visual diagram similar to our *Figure 14* or *15*. We further speculate that one or more of the recipients went on to share this diagram with others. This speculation is based on our identification of a version of the corrupted cone that was disseminated among substance abuse professionals in the late 1970s. It appeared in a self-instructional manual distributed by the National Institute on Drug Abuse:

- Bauman, A. R. (1979). *Training of trainers: Trainer's manual*, revised May 1977. Rockville, MD: US Department of Health, Education, and Welfare; National Institute on Drug Abuse of the Alcohol, Drug Abuse, and Mental Health Administration, Public Health Service. This self-instructional manual was designed as a rather comprehensive guide for novices in all the basic skills of being a trainer in an adult learning setting. Its ten modules cover the topics of learning theory, group process, needs assessment and specification of objectives, designing training activities, small-group presentations, individual presentations, evaluation, trainer interventions, and using training materials.

A corrupted cone, similar to our *Figure 14*, is featured on page I-39 in the module on Learning Theory. The page is entitled "Dale's Cone of Experience." A corrupted cone including the mythical retention percentages—not Dale's Cone—is used to illustrate "an important learning principle, supported by extensive research"... "that persons learn best when they are actively involved in the learning process." The author incorrectly cites "Wiman & Mierhenry" as the source.

Bruce Nyland may be one of many substance abuse counselors who used this self-instructional manual and adapted its contents to his own outreach efforts.

James E. Stice

Prof. Stice is an example of a well-meaning scholar

who innocently accepted the widely circulated corrupted cone as a legitimate scholarly product. He has been for many years a champion of instructional innovation in the field of engineering education. In a 1987 article primarily devoted to the possibilities of using Kolb's learning cycle to improve student learning, he alluded to "some data from the old Socony-Vacuum Oil Company" that aligned with some retention figures he had received privately from a colleague (Stice 1987, p. 293). The text includes a retention chart similar to our *Figure 5*, with Stice stating that he has no other information as to the source. Neither the "Socony-Vacuum's" nor the colleague's retention data were actually traced back to any research source. Unfortunately, Stice's support for the mythical retention data attracted a large following in engineering education.

Who Is James E. Stice?

James E. Stice (b. 1928) has been a faculty member at the University of Texas since 1968, teaching primarily in the area of chemical engineering. He received the BSChE degree from the University of Arkansas in 1949 and the PhD from the Illinois Institute of Technology in 1963. Although he retired from teaching in 1996, he has continued the work he started in 1973 at the Center for Teaching Effectiveness. He has received a dozen teaching awards and other honors for his contributions to teaching excellence and has authored and co-authored numerous articles and chapters on engineering education.

What Did James E. Stice Write?

As an accomplished researcher and teacher in the field of chemical engineering, Stice has accumulated a hefty dossier of publications. Most relevant to present purposes are his more recent works on engineering education, a dozen or so since the 1980s. The article that garnered the most attention:

- Stice, J. E. (1987). Using Kolb's learning cycle to improve student learning. *Journal of Engineering Education*, 77(5), 291-296. The article focuses on the learning-style inventory developed by David Kolb (1984). Kolb's four-stage learning cycle claims that concrete experiences form the basis for observations and reflection; these observations lead to concepts from which new implications for action can be deduced, serving as guides for action and for creating new concrete experiences, completing the cycle. Stice suggests how this notion can be used to radically improve engineering education.

As is discussed at greater length in "The Mythical Retention Chart and the Corruption of Dale's Cone of Experience" in this special issue, in private communications with the authors Stice reports that he received

the retention chart as a handout in a “train the trainer” workshop around 1970. In any event, this paper attracted a cascade of followers, firmly entrenching Stice—and the “Socony-Vacuum” retention chart—in the engineering education literature.

Eventually someone questioned the legitimacy of these claims and carried out a network analysis of citations to identify the source(s) of the fallacious retention chart (Holbert & Karady, 2008). Their analysis centered on Stice as the most frequently cited source, with a link back to Treichler (1967) as the only earlier published purveyor of the retention data. Holbert and Karady urged their colleagues to cease reference to this “unsupported statement.” In fact, Stice (2009) subsequently penned an earnest and wholehearted retraction.

Conclusions

Looking at the *dramatis personae* in this drama, we note that the people who are most often cited as authoritative sources of the corrupted cone either had nothing to do with it (William Glasser, Ray Wiman, Wes Meierhenry) or lacked credible backgrounds as possible creators of a research-based intellectual product in the field of educational technology (Nyland, Phillips, Treichler). A parallel conclusion is that authors who are most expert in the area encompassed by the corrupted cone are the most critical of its plausibility (e.g., Frank Dwyer).

The corrupted cone is a mythological will-o-the-wisp, a mirage arising out of marsh gas, most seductive to those without the professional background to assess the credibility of the various bogus claims that have been made. It lends a sense of scientific support to an oversimplified concept that obviously appeals to those seeking easy answers about selecting instructional media and methods.

Educators and trainers wish that the corrupted cone were valid. When disseminating it to others, they want to signify its scientific credibility so they attach a reference, usually lifted from a handout they received at a conference or saw on a Website.

In this way inaccurate or non-existent references have gained a foothold, not so much in the formal literature but in the ephemeral sphere, merely by being repeated by generation after generation of borrowers. We hope this small contribution helps stem that tide of misinformation. □

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Exhibits in Special Issue

The quotations in the Exhibits in this issue, beginning on page 39, represent a sample of the myriad attempts that have been made to offer some sort of scholarly credibility for the mythical retention data or the corrupted cone. They are not meant to be read independently, but are referenced in the articles in this issue. Our main intention is to list for the record some examples of spurious attributions that have been concocted by various authors. Further, we are showing these citations in context so the reader can appreciate more fully the struggles that other authors have endured in order to try to find wording—often vague and evasive—to prop up attributions which they know are not on solid ground. (The Exhibits are listed in alphabetical order by name of purported author, except for *Exhibit 13*, which is a letter, not a citation.)

All of the citations shown in this list of Exhibits are INCORRECT, in whole or in part. Some of them do refer to actual published works and may be technically accurate in terms of naming a real author, book, and publisher, but even these are incorrect in that the source does not actually say what the writer claims it says. For example, a reference to Dale's Cone plus the mythical percentages may cite "Dale, 1946," as in *Exhibit 3*. There is a book written by Edgar Dale in 1946, and while it does contain the original Cone of Experience, it definitely does not contain the mythical percentages.

Some refer to an actual work but get the author—and/or content—wrong. For example, one of the most frequently used spurious citations is "Wiman and Mierhenry" [sic], *Exhibit 12*. There is an anthology edited by Ray Wiman and Wes Meierhenry (note correct spelling), but it contains no chapters about Dale's Cone. However, two chapters (not written by Ray Wiman or Wes Meierhenry) do contain footnotes referring peripherally to the original Dale's Cone, but not to the mythical retention figures or the corrupted cone that incorporates those percentages. The frequent repetition of the incorrect spelling of Meierhenry's name is further indication that the abusers of this citation are copying from other users, not actually consulting the original source.

Most of the exhibits are earnest attempts to put academic window dressing on information borrowed from a non-academic source. The user saw the information in a handout at a conference and grasped at any handy name that seemed associated with the data; see *Exhibit 4*, for example.

In some cases authors are reduced to citing previous works of their own, works in which they first offered the mythical retention data, vaguely citing one of the other spurious sources, as in *Exhibits 6 and 9*.

Some of the references, such as *Exhibit 2* and *Exhibit 7*, are totally fallacious, and probably consciously so.

These inaccurate or non-existent attributions are shown as examples of the many attempts people have made to find scholarly cover for their use of the mythical retention data or corrupted Dale's Cone. The Editors implore readers to resist the temptation to ever consider repeating any of these bogus citations.

—The Issue Editors

Timeline of the Mythical Retention Chart and Corrupted Dale's Cone

Deepak Prem Subramony

Grand Valley State University

Michael Molenda

Indiana University

Anthony K. Betrus

State University of New York at Potsdam

Will Thalheimer

Work-Learning Research, Inc.

Using a table format, the authors trace the chronological development of the concepts of (a) the mythical retention chart, (b) Edgar Dale's "Cone of Experience," and (c) the combination of the retention data and the Cone into the corrupted cone.

Objective

In this special issue we are trying to trace the origins and evolution of three different concepts—the mythical retention chart, the real Dale's Cone of Experience, and the corrupted cone, the illegitimate overlay of the retention data on some version of Dale's Cone.

In order to follow these moving targets, we have prepared a rough chronological timeline. The timeline shows separate streams of development for the retention chart and the Cone of Experience up until 1970, when we have the first credible claim of seeing the two concepts combined into the corrupted cone.

The events shown in the timeline are chosen for illustrative purposes. These are events for which we have adequate documentation and dating. The actual trail of diffusion of these three problematic concepts is actually far broader and vaguer. We are merely attempting to show the skeletal outlines of the diffusion story as it developed in the United States. □