pp. 14–16, 29–30, 48.

United States Army. Ordnance School. (1943). *History of the Ordnance School, Aberdeen Proving Ground, Maryland, December, 1901 to March, 1943*. Aberdeen Proving Ground, MD: Ordnance School.

Vlcek, C. W., & Wiman, R. V. (1989). *Managing media services: Theory and practice*. Englewood, CO: Libraries Unlimited.

Wiman, R. V. (1972). *Instructional materials: An illustrated handbook of ideas, skills, and techniques for producing and using audiovisual materials*. Worthington, OH: Charles A. Jones Publishing.

Wiman, R. V., & Meierhenry, W. C. (Eds.). (1969). *Educational media: Theory into practice*. Columbus, OH: Charles E. Merrill Publishing.

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.
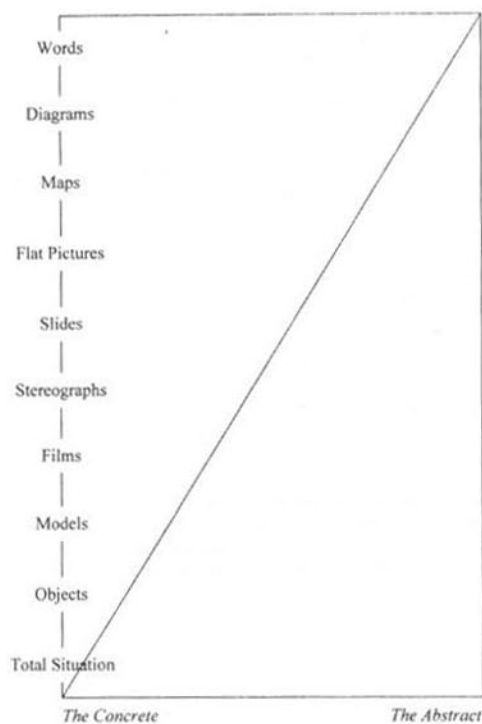
Figures for Special Issue

Figure 1. Hoban, Hoban, & Zisman's media/abstractness diagram, 1937
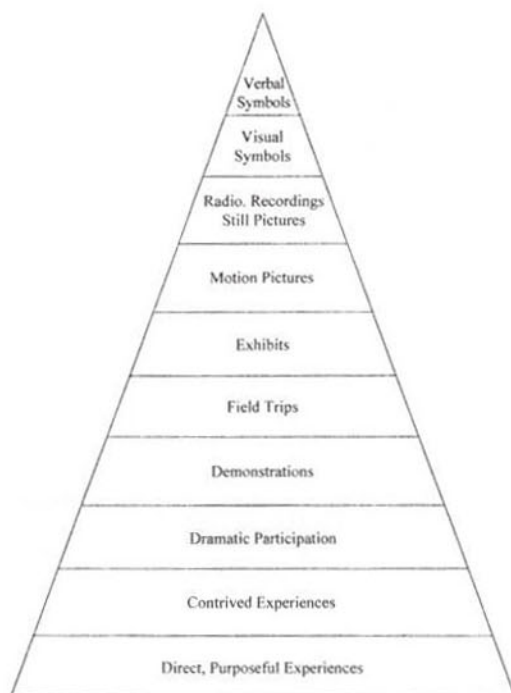

Figure 2. Dale's Cone of Experience, 1946 edition
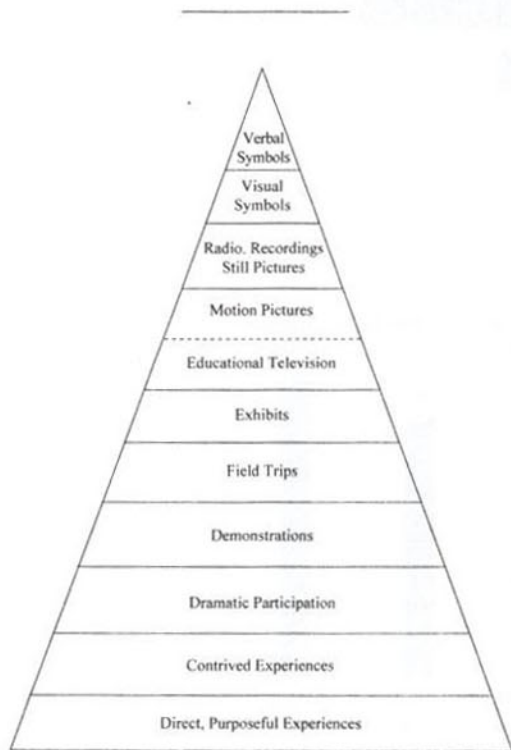

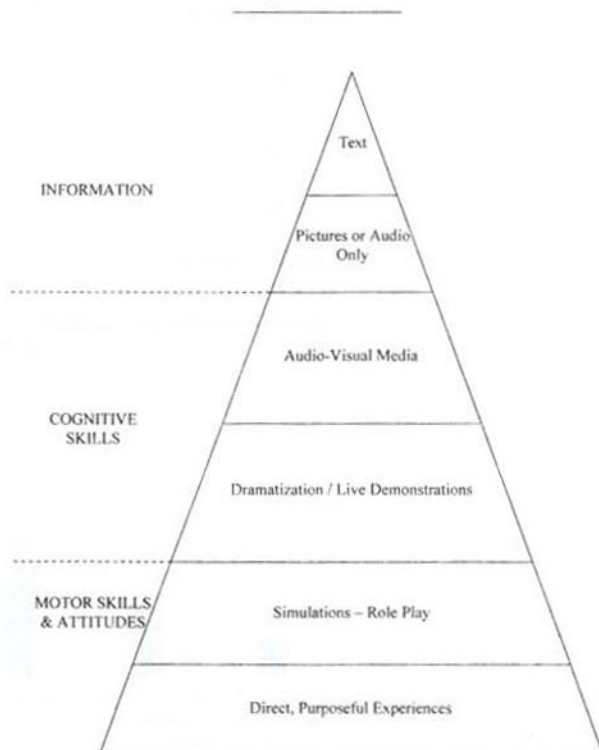Figure 3. Dale's Cone of Experience, 1954 and 1969 editions (Television added)

Figure 4. Dale's Cone modified (categories condensed) plus Learning Objectives

People generally remember		We learn:		Learners retain approximately:	
10% of what they	READ	10%	of what we read	90%	of what they learn when they teach someone else/use immediately
20% of what they	HEAR	20%	of what we hear		
30% of what they	SEE	30%	of what we see	75%	of what they learn when they practice what they learned
50% of what they	HEAR & SEE	50%	of what we see and hear	50%	of what they learn when engaged in a group discussion
70% of what they	SAY	70%	of what we discuss with others		
90% of what they	SAY AS THEY DO A THING	80%	of what we experience personally	30%	of what they learn when they see a demonstration
		95%	of what we teach to someone else	20%	of what they learn from audio-visuals
				10%	of what they learn from reading
				5%	of what they learn from lecture
				Source: NTL Institute for Applied Behavioral Science	

Figure 5. Retention data in chart format à la Treichler, 1967	**Figure 6. Retention chart modified with altered numbers, expanded categories, and shift of claim from retention to learning**	**Figure 7. Retention chart modified with altered numbers, expanded categories, and shift of claim to learning and retention, plus spurious source**

We remember by...

- Reading, discussing & doing — 90%
- Reading & discussing — 70%
- Seeing — 30%
- Hearing — 20%
- Reading — 10%

Source: Forrester Research
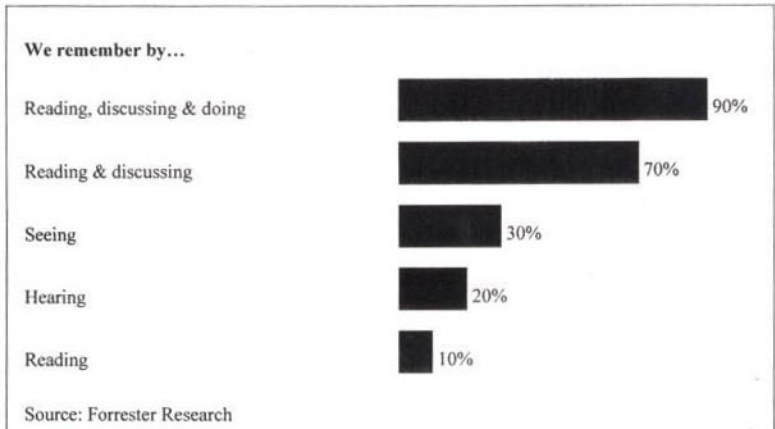
Figure 8. Retention chart modified with altered numbers and converted to horizontal bar graph, plus spurious source
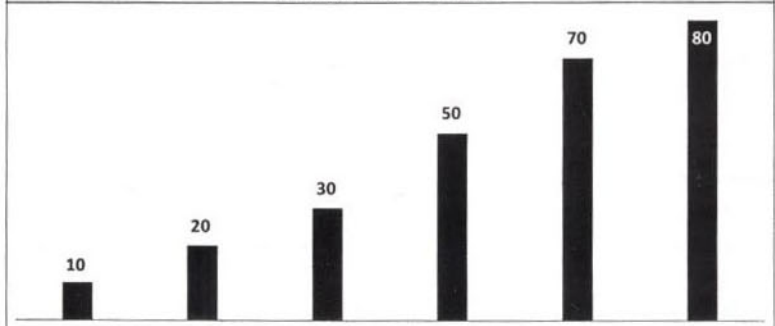
10 20 30 50 70 80

Chi, M. T. H., Bassok, M., Lewis, M. W., Reimann, P., & Glaser, R. (1989). Self-explanations; How students study and use examples in learning to solve problems. *Cognitive Science, 13,* 145-182

Figure 9. Retention chart modified with altered numbers and converted to vertical bar graph, plus spurious journal citation
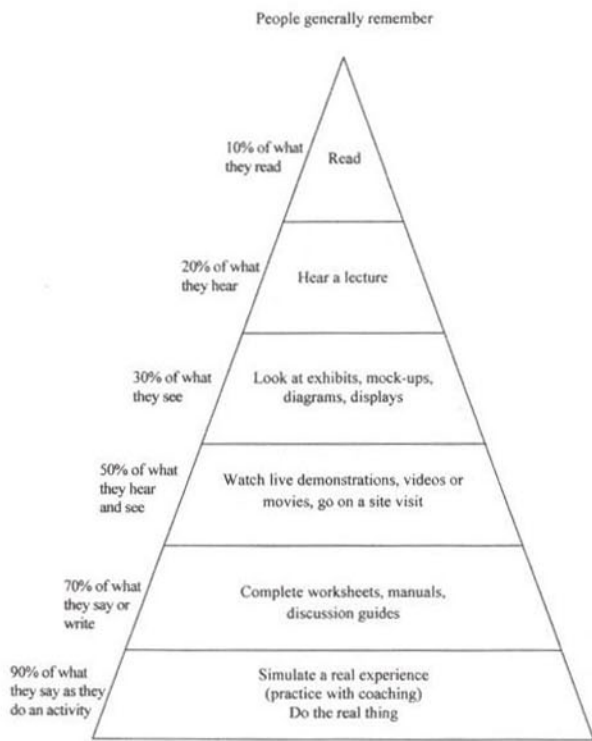
People generally remember

10% of what they read — Read

20% of what they hear — Hear a lecture

30% of what they see — Look at exhibits, mock-ups, diagrams, displays

50% of what they hear and see — Watch live demonstrations, videos or movies, go on a site visit

70% of what they say or write — Complete worksheets, manuals, discussion guides

90% of what they say as they do an activity — Simulate a real experience (practice with coaching) Do the real thing

Figure 10. Dale's Cone condensed and truncated, with retention data aligned

AVERAGE RETENTION RATE

5% — Lecture

10% — Reading

20% — Audio-Visual

30% — Demonstration

50% — Discussion Group

75% — Practice by Doing

90% — Teach Others / Immediate Use

Figure 11. Dale's Cone modified, with retention data aligned

PEOPLE GENERALLY REMEMBER

10% of what they read
20% of what they hear — Read / Hear

30% of what they see — View Images / Watch Images

50% of what they hear and see — Visit Exhibits/Sites / Watch a Demonstration

70% of what they say and write — Participate in Hands-On Workshop / Design Collaborative Lessons

90% of what they say as they do a thing — Simulate, Model or Experience a Lesson / Design/Perform a Presentation – Do "Real Thing"

PEOPLE ARE ABLE TO (LEARNING OUTCOMES)

- Define
- List
- Describe
- Explain

- Demonstrate
- Apply
- Practice

- Analyze
- Design
- Create
- Evaluate

Figure 12. Dale's Cone modified, with retention data aligned, plus "Learning Outcomes"

RETENTION RATES:

WEB DELIVERY METHODS

LEARNING STYLES AFFECTED: KINESTHETIC VISUAL SOCIAL AUDIO

5% — Lecture — K, V

10% — Reading — K, V

20% — Audio-Visual — K, V, S, A

30% — Demonstration — K, V

50% — Discussion Group — K, V, S

75% — Practice by Doing — K, V, S

90% — Teach Others / Immediate Use — K, V, S, A
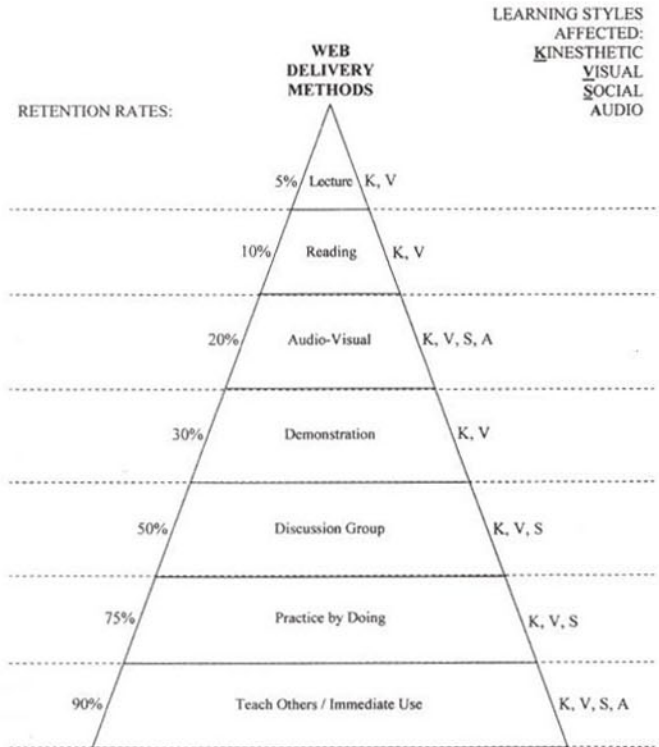
Figure 13. Dale's Cone modified, with retention data modified and aligned, plus "Learning Styles"

PEOPLE GENERALLY REMEMBER:

- ?
- 10% of what they read — Read — Verbal Receiving
- 20% of what they hear — Hear words
- 30% of what they see — Watch still pictures
- 50% of what they hear and see — Watch moving pictures / Watch exhibit / Watch Demonstration — Visual Receiving
- 70% of what they say and write — Do site visit / Do a dramatic presentation — Hearing, Saying
- 90% of what they say as they do a thing — Simulate a real experience / Do the real thing — Seeing and Doing
- ?????

NATURE OF INVOVEMENT:

Figure 14. Dale's Cone modified (question marks added), with retention data aligned, plus "Nature of Involvement"

AFTER 2 WEEKS WE TEND TO REMEMBER:

- 10% of what we read — Reading — Verbal receiving
- 20% of what we hear — Hearing Words
- 30% of what we see — Looking at pictures
- 50% of what we hear and see — Watching a movie / Looking at an exhibit / Watching a demonstration / Seeing it done on location — Visual receiving
- 70% of what they say and write — Participating in a discussion / Giving a talk — Receiving/Participating
- 90% of what they say as they do a thing — Doing a dramatic presentation / Simulating the real experience / Doing the real thing — Doing

NATURE OF INVOVEMENT:

Passive / Active

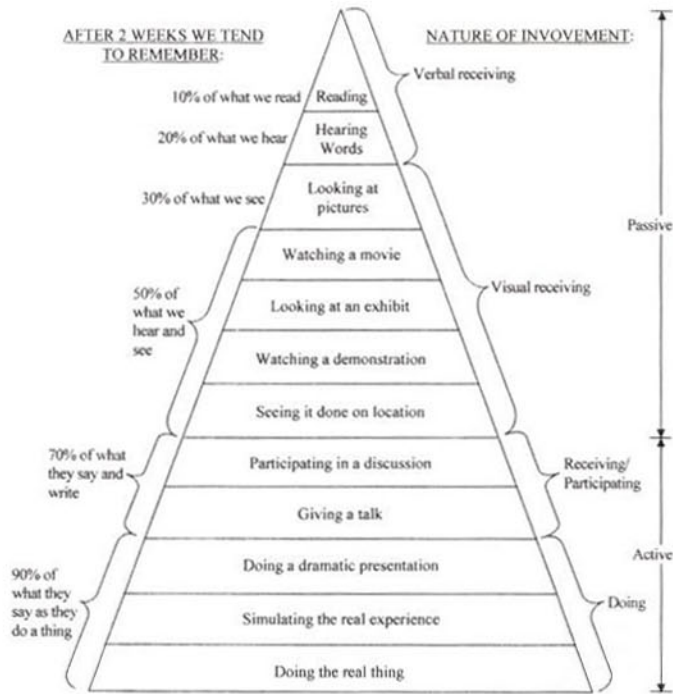Figure 15. Dale's Cone heavily modified, with retention data aligned, plus "Nature of Involvement" and "Active/Passive"

- TELL — Story Lecture Records — People remember a smaller percentage of things we TELL them.
- SEE — Objects, pictures, charts, maps, films, filmstrips, exhibits — People remember larger percentage of things they SEE.
- DO — Field Trips / Demonstrations / Dramatic Participation / Direct, Purposeful Experiences — People remember most of what they DO.
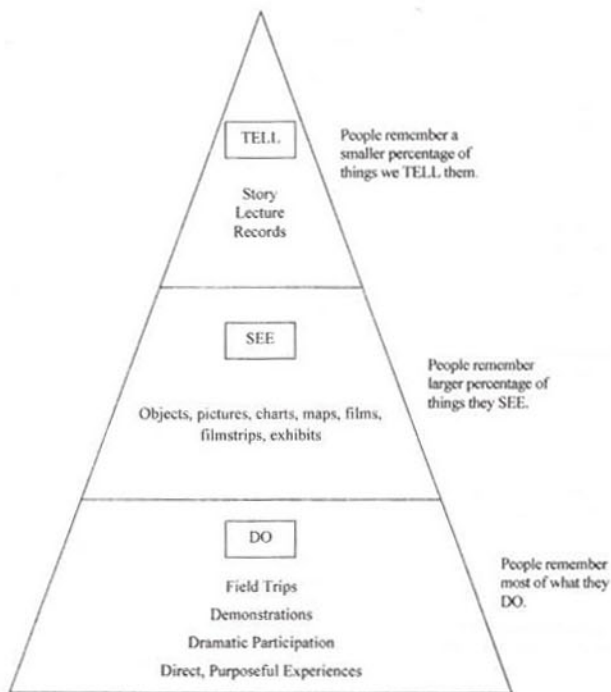
Figure 16. Dale's Cone and retention data condensed into three categories

Exhibits for Special Issue

Example #1:
Developing Professional Skills from the Higher Education Academy at the UK Centre for Materials Education website. Available online at: http://www.materials.ac.uk/guides/developing.asp. Retrieved November 25, 2013.

> Research commissioned by the **British Audio Visual Society** in 1988 suggests that we remember 10% of what we read, 20% of what we hear, 30% of what we see, 50% of what we see and hear, 80% of what we say and 90% of what we say and do at the same time.

- - - - - - - - - - - -
UK Centre's website's References:

No reference is provided on the website.

Example #2:
Pollock, G. (1996). The essential elements of multimedia: Content is not the only answer. In C. McBeath and R. Atkinson (Eds), *The Learning Superhighway: New world? New worries?* Proceedings of the Third International Interactive Multimedia Symposium, 323-327. Perth, Western Australia, 21-25 January. Available online at: http://cleo.murdoch.edu.au/gen/aset/confs/iims/96/lp/pollock.html. Retrieved November 25, 2013.

> Interactivity refers to the actions by the user and the resulting responses and feedback from the computer. In a learning context, the claim is the higher the level of interactivity the more successful will be the learning experience. These claims date back to an old Chinese proverb which states:
>> If you tell me, I will listen
>> If you show me, I will see
>> If you let me experience, I will learn
>
> More current research, such as that conducted by the **British Audio-Visual Society**, has come up with various figures about how much information learners retain such as:
>> 10% of what is read
>> 20% of what is heard
>> 30% of what is seen
>> 50% of what is seen and heard
>> 80% of what is spoken
>> 90% of what is spoken and performed
>
> Although the figures may differ from study to study, the conclusion remains the same - learning and retention increase as the learner is more involved.

- - - - - - - -
Pollock's References:

No reference is provided by the author.

Exhibit 1. British Audio-Visual Society, 1988

Example:
Thalheimer, W. (2006). "People remember 10%, 20%...Oh Really?" *Will at Work Learning* blog, available online at: http://www.willatworklearning.com/2006/05/people_remember.html. Retrieved November 26, 2013.

My investigation of this issue began when I came across the following graph:

[See our Figure 9]

The Graph is a Fraud!
After reading the cited article several times and not seeing the graph---nor the numbers on the graph---I got suspicious and got in touch with the first author of the cited study, Dr. Michelene Chi of the University of Pittsburgh (who is, by the way, one of the world's leading authorities on expertise). She said this about the graph: *"I don't recognize this graph at all. So the citation is definitely wrong; since it's not my graph."*

What makes this particularly disturbing is that this graph has popped up all over our industry, and many instructional-design decisions have been based on the information contained in the graph.

- - - - - - - - - - - -
Thalheimer's References:

Chi, M.T.H., Bassok, M., Lewis, M.W., Reimann, P., & Glaser, R. (1989). Self-Explanations: How Students Study and Use Examples in Learning to Solve Problems. *Cognitive Science, 13*,145–182.

Exhibit 2. Chi, Bassok, Lewis, Reimann, & Glaser, 1989

Example #1:
Marshall, J.M. (2002). *Learning with technology: Evidence that technology can, and does, support learning.* White paper prepared for Cable in the Classroom.

Researchers posit that explanations presented in words and pictures, as opposed to words or pictures, make for increased comprehension (Mayer, 2001) for the learner. **Dale's "Cone of Experience"** (1946, 1996) provides evidence of these phenomena. Dale's research suggested that increasing the modalities by which content was presented could increase retention rates. Wiman and Mierhenry (1969) extended Dale's concept to conclude that people will generally remember

- 10 percent of what they read
- 20 percent of what they hear
- 30 percent of what they see
- 50 percent of what they hear and see

- - - - - - - - - - - -
Marshall's References:

Dale, E. (1946). *Audiovisual methods in teaching.* New York: Dryden Press.
Dale, E. (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.
Mayer, R.E. (2001). *Multimedia learning.* Cambridge, England: Cambridge University Press.
Wiman, R.V., and Mierhenry, W.C. (1969). *Editors, educational media: Theory into Practice.* Columbus, OH: Charles Merrill Publishing.

Exhibit 3. Dale, 1946, 1969, and 1996

Example #2:

Stice, James E. "Using Kolb's learning cycle to improve student learning," *Journal of Engineering Education*, vol. 77, no. 5, Feb. 1987, pp. 291-296

As previously discussed, each of the four different learning styles has its strengths and weaknesses. Not obvious on the face, however, is that learning (or at least retention) is enhanced as more of the learning stages are used. According to Dixon,[3] 20 percent is retained if only AC is used; if both RO and AC are used, retention is increased to 50 percent; if one used CE+RO+AC, it rises to 70 percent; 90 percent is retained if all four learning stages are employed.

This sounds a little surprising, but the results are similar to some data from the old Socony-Vacuum Oil Company. (The source indicates the data are from the 1930s or 1940s, but I have no other information.) The data:

Learning method	Retention by Learner
What they read	10%
What they hear	26
What they see	30
What they see and hear	50
What they say	70
What they say as they do something	90

If reading and hearing are concrete experience (CE) and seeing is reflective observation (RO), then the Socony-Vacuum numbers are nearly identical to Dixon's retention percentages for Kolb's model. Further credence is lent by similar figures reported for **Edgar Dale's**[4] "cone of learning."

- - - - - - - - - - - - - -

Stice's References:

3. Dixon, Nancy, private discussions, Austin, Texas
4. Dale, Edgar, *Audio-Visual Methods in Teaching*, (3rd edit.), Holt, Rinehart and Winston, 1969, p. 107.

Exhibit 3. Dale, 1946, 1969, and 1996 (cont.'d)

Example #1:

Holbert, K.E. and Karady, G.G. (2008). Removing an unsupported statement in engineering education literature. *Proceedings of the 2008 American Society for Engineering Education Pacific Southwest Annual Conference*, Flagstaff, AZ, March 27-28, 2008. Copyright © 2008, American Society for Engineering Education.

More recently, Prof. Stice stated in an email that he received that Socony-Vacuum Oil Co. data "as a one-page handout at a workshop I attended in the 1970s at the University of Wisconsin-Eau Claire [4]." Prof. Stice also notes that at the same workshop he obtained "a handout called 'the Cone of Learning,' as adapted by a **Bruce Nyland** after work done by Dr. **Edgar Dale**."

- - - - - - - - - - - - - -

Holbert & Karady's References:

[4] J.E. Stice, "Socony-Vacuum study," email communication, May 12, 2007.

Example #2:

Gustafson, C.B. (Gus), Increased stimulation with audiovisual aids in training, *jems, a Journal of Emergency Medical Services*, June 1985, p. 61.

There is no discussion in the text, but the article includes an illustration, similar to our Figure 14, captioned "Cone of Learning" and giving this source: "developed and revised by **Bruce Nyland** from material by **Edgar Dale**."

- - - - - - - - - - - -

Gustafson's References:

Neither Nyland nor Dale is listed in the article's References.

Exhibit 4. Dale and Nyland

Example:
Website of The William Glasser Institute (founder of reality therapy and choice theory). Available online at http://www.wglasser.com/articles.htm. Retrieved March 6, 2003.

> Since we get requests about this quote quite often, and Dr. Glasser is not the originator, we thought you might be interested to know that Edgar Dale's "Cone of Experience" can be found in Education Media by Wiman and Mierhenry, Charles Merrill Publishers, 1969; Experience and Learning – Developed and revised by **Bruce Ryland** from material by **Edgar Dale**.

> > *"We learn 10% of what we read*
> > *20% of what we hear*
> > *30% of what we see*
> > *50% of what we see and hear*
> > *70% of what we say or write*
> > *90% of what we teach"*

- - - - - - - - - - - - -
William Glasser Institute's References:

The website does not give any further citations for any of the sources mentioned.

Exhibit 5. Dale and Ryland

Example:
Ekwall, E.E. & Shanker, J.L. (1988). *Diagnosis and remediation of the disabled reader*, 3rd ed. Boston: Allyn and Bacon.

> The Socony Vacuum Oil Company (**Ekwall and Oswald**) did an interesting study on how humans learn in terms of retention. It has some important implications for diagnosis and remediation:

> > Students' Power of Retention
> > 1. 10 percent of what they read
> > 2. 20 percent of what they hear
> > 3. 30 percent of what they see
> > 4. 50 percent of what they see and hear
> > 5. 70 percent of what they say as they talk
> > 6. 90 percent of what they say as they do a thing (p. 370)

- - - - - - - - - - - - -
Ekwall & Shanker's References:

Ekwall, E.E., & Oswald, L.D. (1971). *Rx reading program—teacher's manual*. Glenview, IL: Psychotechnics, Inc.

Exhibit 6. Ekwall and Oswald, 1971

Example:
Thalheimer, W. (2006). "Another Guru Sharing the Same Old Myth." *Will at Work Learning* blog, available online at: http://www.willatworklearning.com/2006/12/another_guru_sh.html. Retrieved November 26, 2013.

> And here's another example of a well-respected industry analyst lazily sharing the biggest myth in the learning field. This time it's from a Senior Industry Analyst with Forrester Research (October 19th, 2006).

> [See our Figure 8]

> Read my initial post describing how this myth got started, and how it harms our field and our learners. The source of the offending PowerPoint slide claims the data as their own ("Source: Forrester Research"). Yeah, I guess if you find false information on the web, then change it around a little bit to help you make your point, that you ought to cite yourself. Is it plagiarism if you steal a lie?

- - - - - - - - - - - -
Thalheimer's References:

Thalheimer did not include any references. The original source, Forrester Research, falsely claimed ownership of the chart; they gave no citation of any other source. The claim has since been deleted from their website.

Exhibit 7. Forrester Research, 2006

Example #1:
Cowart, D. *Education for All*. Available online at: http://principalcowart.blogspot.com/2009/02/how-we-learn-william-glasser.html. Retrieved November 25, 2013.

> How We Learn- **William Glasser**
>
> 10% of what we READ
> 20% of what we HEAR
> 30% of what we SEE
> 50% of what we SEE and HEAR
> 70% of what is DISCUSSED with OTHERS
> 80% of what is EXPERIENCED PERSONALLY
> 95% of what we TEACH TO SOMEONE ELSE
> ~William Glasser

> Remember the lectures in college when the teacher just spoke and you were expected to listen and take notes? Well according to **Glasser** you might remember 20% of what the professor said. If you had a professor that showed notes, images, tables or graphs, you might remember 50% of what was said. This kind of teaching is so ineffective. Yet it is the style still used by most colleges, many high schools and middle schools and even in some elementary schools. Students need to experience things personally and have an opportunity to interact with others. Ultimately, we would want students to teach someone else something. Unfortunately that is not what always happens, even with the best intentions. But all students can work together when given the correct cooperative framework. When given this framework and a meaningful project or task, students will retain up to 80%.

- - - - - - - - - - - -
Cowart's References:

The website does not give any citation.

Exhibit 8. Glasser

Example #2:
Schwed, A. & Melichar-Utter, J. *Brain-Friendly Study Strategies, Grades 2-8: How Teachers Can Help Students Learn.* Thousand Oaks, CA: Corwin Press.

> Teachers need to integrate visual, auditory, and kinesthetic methods in order to reach learners who learn through different modalities. In the late 1960s, **William Glasser** popularized this point with the following concept:
>
> WE LEARN
> 10% of what we read
> 20% of what we hear
> 30% of what we see
> 50%^ of what we both see and hear
> 70% of what is discussed with others
> 80% of what we experience personally
> 95% of what we TEACH to someone else (p. 19)

- - - - - - - - - - -
Schwed's References:

No reference is provided for the Glasser claim.

Exhibit 8. Glasser (cont.'d)

Example:
EDC's Center for Children and Technology, Corporation for Public Broadcasting. *Television goes to school: The impact of video on student learning in formal education.* Washington, DC: Corporation for Public Broadcasting, 2004.

> We've all heard the proverb: "Seeing is believing." Research has shown that seeing is remembering, too. **Marshall** (2001) cites the conclusions of Wiman and Mierhenry (1969) who found that "…people will generally remember:
> - 10% of what they read
> - 20% of what they hear
> - 30% of what they see
> - 50% of what they see and hear."

- - - - - - - - - - - -
EDC's References:

Marshall, J.M. (2002). *Learning with technology: Evidence that technology can, and does, support learning.* White paper prepared for Cable in the Classroom.

No full citation is given for "Wiman and Mierhenry."

Exhibit 9. Marshall, 2001

Example #1:
Wood, E.J. Problem-Based Learning: Exploiting Knowledge of How People Learn to Promote Effective Learning. *Bioscience Education E-Journal*, Vol. 3, May 2004. Available online at: http://journals.heacademy.ac.uk/doi/pdf/10.3108/beej.2004.03000006. Retrieved January 15, 2014.

> The general consensus about the effectiveness of various teaching methods is summarised in the "learning pyramid" (Fig. 1) which has appeared in various forms, and this version of the diagram simply deals with how effectively students are thought to retain information (page 5)

Wood's Figure 1 (page 4) is similar to our Figure 10.

- - - - - - - - - -
Wood's References:

Wood's Figure 1 has this caption: "The Learning Pyramid. The learning pyramid originates from the **National Training Laboratories** (NTL) for Applied Behavioral Science, 300 N. Lee Street, Suite 300, Alexander, VA 22314, USA. The percentages represent the average "retention rate" of information following teaching or activities by the method indicated. In fact this diagram was originally developed and used by NTL in the early 1960s at NTL's Bethel, Maine, campus, but the organisation no longer has or can find the original research that supports the numbers given. In 1954 a similar pyramid with slightly different numbers had appeared in a book, Audio-Visual Methods in Teaching, published by the Edgar Dale Dryden Press, New York. Bligh (1998) gives some evidence for the effectiveness of different teaching methods."

Example #2:
Academic Spaces That Improve Learning Outcomes on website of Tradeline. Available online at http://www.tradelineinc.com/reports/2011-4/academic-spaces-improve-learning-outcomes. Retrieved January 15, 2014.

> Studies by the **National Training Laboratories** (NTL) of Arlington, Va., demonstrate how learning environments affect retention. The old-fashioned lecture format produces a 5 percent retention rate, while giving students an opportunity to practice by doing results in a 75 percent retention rate...

- - - - - - - - - -
Tradeline's References:

"This report is based on a presentation given by Colleen O'Connor Grochowski, Mary Jo Olenick, and Robert Pulito at Tradeline's Academic Medical and Health Science Centers 2010 conference."

Example #3:
Thalheimer, W. (2006). *NTL continues its delusions*. Will at Work Learning website. Available online at www.wilklatworklearning.com/myths_and_worse/index.html. Retrieved January 17, 2007.

Thalheimer reports on his personal correspondence with the NTL Institute, which included the following claim, which appears to be a "form" response sent to all who inquired:

> Thanks for your inquiry of NTL Institute. We are happy to respond to your inquiry about The Learning Pyramid. Yes, it was developed and used by **NTL Institute** at our Bethel, Maine campus in the early sixties when we were still part of the National Education Association's

Exhibit 10. National Training Laboratories or NTL Institute

Adult Education Division. Yes, we believe it to be accurate - but no, we no any longer have - nor can we find - the original research that supports the numbers. We get many inquiries every month about this - and many, many people have searched for the original research and have come up empty handed. We know that in 1954 a similar pyramid with slightly different numbers appeared on p. 43 of a book called Audio-Visual Methods in Teaching, published by the Edgar Dale Dryden Press in New York. Yet the Learning Pyramid as such seems to have been modified and always has been attributed to NTL Institute.

To summarize the numbers (which sometimes get cited differently) learners retain approximately:

>>90% of what they learn when they teach someone else/use immediately.
>>75% of what they learn when they practice what they learned.
>>50% of what they learn when engaged in a group discussion.
>>30% of what they learn when they see a demonstration.
>>20% of what they learn from audio-visual.
>>10% of what they learn when they've learned from reading.
>>5% of what they learn when they've learned from lecture.

Feel free to use the Learning Pyramid (below) as you wish without charge - and cite at the bottom - "NTL Institute for Applied Behavioral Science, 300 N. Lee Street, Suite 300, Alexandria, VA 22314. 1-800-777-5227."

["Learning Pyramid," similar to our Figure 10, is included in letter.]

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References:

Thalheimer provided no further reference information. NTL provided only the inaccurate Dale citation.

Exhibit 10. National Training Laboratories or NTL Institute (cont.'d)

Example #1:
Stice, James E. "Using Kolb's learning cycle to improve student learning," *Journal of Engineering Education*, vol. 77, no. 5, Feb. 1987, pp. 291-296

As previously discussed, each of the four different learning styles has its strengths and weaknesses. Not obvious on the face, however, is that learning (or at least retention) is enhanced as more of the learning stages are used. According to Dixon,[3] 20 percent is retained if only AC is used; if both RO and AC are used, retention is increased to 50 percent; if one used CE+RO+AC, it rises to 70 percent; 90 percent is retained if all four learning stages are employed.

This sounds a little surprising, but the results are similar to some data from the old **Socony-Vacuum Oil Company**. (The source indicates the data are from the 1930s or 1940s, but I have no other information.) The data:

Learning method	Retention by Learner
What they read	10%
What they hear	26
What they see	30
What they see and hear	50
What they say	70
What they say as they do something	90

Exhibit 11. Socony-Vacuum Oil Co. or Standard Oil of NY

If reading and hearing are concrete experience (CE) and seeing is reflective observation (RO), then the **Socony-Vacuum** numbers are nearly identical to Dixon's retention percentages for Kolb's model. Further credence is lent by similar figures report for Edgar Dale's[4] "cone of learning."

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Stice's References:

3. Dixon, Nancy, private discussions, Austin, Texas
4. Dale, Edgar, *Audio-Visual Methods in Teaching*, (3rd edit.), Holt, Rinehart and Winston, 1969, p. 107.

Example #2:
Golich, V.L., Boyer, M, Franko, P., & Lamy, S. (2000). *The ABCs of Case Teaching. Pew Case Studies in International Affairs*. Washington, DC: Institute for the Study of Diplomacy, Georgetown University.

The point is made by a study carried out by the **Socony-Vacuum Oil Company** that concludes that student retain 10% of what they read; 26% of what they hear; 30% of what they see; 50% of what they see and hear; 70% of what they say; and 90% of what they say and do.

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Golich's References:

No source for this claim is given in the article's References.

Example #3:
Ekwall, E.E. & Shanker, J.L. (1988). *Diagnosis and remediation of the disabled reader*, 3rd ed. Boston: Allyn and Bacon.

The **Socony Vacuum Oil Company** (Ekwall and Oswald) did an interesting study on how humans learn in terms of retention. It has some important implications for diagnosis and remediation:

Students' Power of Retention
1. 10 percent of what they read
2. 20 percent of what they hear
3. 30 percent of what they see
4. 50 percent of what they see and hear
5. 70 percent of what they say as they talk
6. 90 percent of what they say as they do a thing (p. 370)

- - - - - - - - - - - - -
Ekwall & Shanker's References:

Ekwall, E.E., & Oswald, L.D. (1971). *Rx reading program—teacher's manual*. Glenview, IL: Psychotechnics, Inc.

Example #4:
Dwyer, F. M. (1978). *Strategies for improving visual learning*. State College, PA: Learning Services.

Figure I-4 presents data distributed by the **Socony-Vacuum Oil Company** which illustrates the importance attributed to the visual medium in the learning process.

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Dwyer's Reference:

Treichler, 1967, p. 15 (which does not actually attribute the retention data to "Socony-Vacuum Oil Co.")

Exhibit 11. Socony-Vacuum Oil Co. or Standard Oil of NY (cont.'d)

Example #1:

Marshall, J.M. (2002). *Learning with technology: Evidence that technology can, and does, support learning.* White paper prepared for Cable in the Classroom. Washington, DC: Cable in the Classroom.

Researchers posit that explanations presented in words and pictures, as opposed to words or pictures, make for increased comprehension (Mayer, 2001) for the learner. Dale's "Cone of Experience" (1946, 1996) provides evidence of these phenomena. Dale's research suggested that increasing the modalities by which content was presented could increase retention rates. **Wiman and Mierhenry** (1969) extended Dale's concept to conclude that people will generally remember

- 10 percent of what they read
- 20 percent of what they hear
- 30 percent of what they see
- 50 percent of what they hear and see

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Marshall's References:

Dale, E. (1946). *Audiovisual methods in teaching.* New York: Dryden Press.
Dale, E. (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.
Mayer, R.E. (2001). *Multimedia learning.* Cambridge, England: Cambridge University Press.
Wiman, R.V., and Mierhenry, W.C. (1969). *Editors, educational media: Theory into Practice.* Columbus, OH: Charles Merrill Publishing.

Example #2:

Website of The William Glasser Institute (founder of reality therapy and choice theory), 1925-2013. Available online at: http://www.wglasser.com/articles.htm. Retrieved March 6, 2003.

Since we get requests about this quote quite often, and Dr. Glasser is not the originator, we thought you might be interested to know that Edgar Dale's "Cone of Experience" can be found in Education Media by **Wiman and Mierhenry**, Charles Merrill Publishers, 1969; Experience and Learning – Developed and revised by Bruce Ryland from material by Edgar Dale.

> *"We learn 10% of what we read*
> *20% of what we hear*
> *30% of what we see*
> *50% of what we see and hear*
> *70% of what we say or write*
> *90% of what we teach"*

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William Glasser Institute's References:

The website does not give a full citation for any of the sources mentioned.

Exhibit 12. Wiman and Mierhenry [sic], 1969

INDUSTRIAL EDUCATION DEPARTMENT
PHONE GR. 6-3271

Pers-C14-dmj
Ser. C14/1681
November 22, 1963
November 27, 1963

Mr. Michael B. Callahan
Head, Training Aids Branch
Department of the Navy
Bureau of Naval Personnel
Washington 25, DC

Dear Mr. Callahan:

The information in this letter will let you know where we got the percentages included on our sheet "Some Training Principles," TIM-151 (11-55). Originally this sheet was mimeographed; but with the revision in November, 1955, the sketches were added and the percentages are the same as appeared on our original sheet with the same TIM number. This content is on a passout sheet used in "Methods of Teaching" classes and other instructing situations.

In the summer, 1939, Paul John Phillips worked in this office and prepared an Educational Extension Training manual for oil field workers entitled Internal Combustion Engines. In the summer, 1940, Mr. Phillips again worked in this office and prepared a manual for Petroleum Industry Extension Training entitled Pipe Line Compressors. Mr. Phillips had a M.S. degree in Trade and Industrial Education and he was a regular instructor of Automotive Technology in Oklahoma A. and M. College. He was on short-time employment when he came to Texas in 1939 and 1940.

He did not return to Oklahoma A. and M. in September, 1940; rather, he accepted a position at the Aberdeen Maryland Army Proving Ground. Mr. Phillips was a reserve officer and as a reserve officer, he went to the Proving Ground to put in a year of service for his government. After this year was up tension was high and Mr. Phillips remained at the Proving Ground.

Records are not exactly clear but would indicate that Mr. Phillips was an instructor of Visual Aids from 1940 to 1946 at the Ordnance School, Aberdeen Proving Ground, Maryland. 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 in training at Ordnance School.

The percentages and organization of our passout sheet "Some Training Principles," TIM-151 are those set down by Mr. Phillips shortly after he returned to this office. Unfortunately, Mr. Phillips died with some sort of spleen ailment March 3, 1950, and for that reason we have been unable to check with him when we have received letters similar to yours requesting verification.

This explanation will let you know where we originally got these percentages. Our classes are not organized in such a manner that we can experiment and check with controlled groups, but our experiences in teaching gives us no reason to question the apparent reasonableness of these percentages.

Sincerely yours,

Charles Cyrus
Training Specialist

Exhibit 13. Letter from University of Texas (Charles Cyrus), 1963