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A REBUTTAL OF NTL INSTITUTE'S LEARNING PYRAMID

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This article discusses the learning pyramid propagated by National Training Laboratories Institute. It presents and complements the historical and methodological critique against the learning pyramid, and calls for NTL Institute to retract their model.

Keywords: Learning Pyramid; NTL Institute; National Training Laboratories Institute.

Introduction

Most readers are probably familiar with some version of the learning pyramid, and the associated claims that the best way to learn and remember something is by teaching or doing. The retention of these modes of learning have been claimed to be as high as 75, 80 or even 90 percent, whereas attending lectures, or using other theoretical approaches to learning are in comparison extremely inefficient, only resulting in five or 10 percent retention. Earlier critiques of the learning pyramid have focused on the dubious origin of the model (Molenda, 2004; Subramony, 2003), and have demonstrated inconsistencies between the pyramid and the research on retention (Lalley & Miller, 2007).

This article assesses a well-known version of the learning pyramid propagated by NTL Institute. First it will briefly discuss its origins, and disqualify the claim that the model is based on research. It will then raise some essential semantic and methodological criticisms against this model. Finally, it will question the idea of the apparent intuitiveness of the learning pyramid.

Concluding, it will urge NTL Institute to retract their model. And, as their learn-

ing pyramid is but one of several versions, recommend that similar critique ought to be raised against resembling models.

There is no Learning Pyramid

As point of critique goes, this admittedly seems a conclusive one. However, it is a matter of semantics, not of ontology. What normally is referred to as “the learning pyramid”, are in fact several different models relating different degrees of retention from different kinds of learning. Usually they are quantified by neat percentages, like 10, 20, 30, 50 and 90 percent.

In addition, there are several similar models sometimes named “the cone of learning”, “the cone of experience”, “the learning cone”, “the cone of retention”, “the pyramid of learning”, or “the pyramid of retention”, while others are unnamed. In order to subsume all these models under one concept this article simply refers to them as the “learning pyramid”, as this seems to be the most common term.

Thus, it is impossible to criticize the learning pyramid itself, as there is none, and an attempt to criticize them all is unrealistic. However, NTL Institute's model is an obvious candidate for critique. Numer-

ous findings refer to NTL Institute as the source of their model (see for instance: Borthick & Jones, 2000; Busby & Hubbard, 2007; Chun, 2004; Darmer, Ankersen, Nielsen, Landberger, Lippert & Egerod, 2004; DeKanter, 2005; Fu, Su & Yu, 2009; Garden, 2009; Hazlett, 2009; Hoon, Emerson & White, 2006; Janavaras & Gomes, 2007; Janavaras, Gomes & Young, 2008; Katsuragi, 2005; Magennis & Farrell, 2005; Morgan, 2003; Peteroy-Kelly, 2007; Peterson, Rowat, Kreiter, & Mandel, 2004; Qayumi, 2006; Roettger, Roettger & Walugembe, 2007; Sousa, 2006; Thier, 2005; Thomas & Baker, 2008; Wagner, Wagner & Jayachandran 2005; Williams, Hawes & Foley, 2006; Wood, 2004; Zainal, 2011; Zhang & Su, 2007).

NTL Institute's willingness to be associated with the pyramid makes them in no small part responsible for the spreading of the model. They confidently and consistently claim to have performed studies supporting one of the pyramids:

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

While we believe it to be accurate, we no 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 however the Learning Pyramid as such seems to have been modified and remains 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.

(NTL Institute, Personal Communication, October 14, 2009)

This seems to be a standard formulation offered to those enquiring about the model, as others have also reported correspondence with the same wording (See Booth, 2011, p. 41; Lalley & Miller, 2007; Magennis & Farrell, 2005; Polovina, 2011; Thalheimer, 2006). NTL Institute's reply, however, fails to reassure. If the methodology and data behind the model are missing, we have no way of evaluating the results.

How, for instance, did they ensure that the different rates of retention were affected only by the difference in learning methods? Did they test the retention of general knowledge, a series of random names, number, letters or symbols, or did they test some kind of skill? How long did they wait between learning and testing? What were the subjects' age, sex, and general background, and how many were they?

Furthermore, we may concur with Lalley and Miller when they describe what "daunting task" this kind of study would be:

There is an implied assumption that these methods have been compared to one another in a systematic manner employing sound research methodologies. At a minimum, these empirical issues would include:

- * That each of the methods, employed as an experimental treatment, was of the same duration (e.g., a student's reading session would last as long as an indi-

vidual teaching or discussion session).

- * That each of the methods would have been conducted or supervised by the same teacher or that multiple teachers would have been matched in terms of education, teaching experience and subject area (e.g., the lecture being given by the same teacher as the one leading the discussion). Further, the teacher(s) should have been well versed in both content and method.
- * That the content to be learned with each method would be the same, regardless of the method being employed.
- * That the outcome measure(s), or dependent variable(s), was one measuring retention, the ability to recall or do something after a time delay (e.g., days, weeks or months), rather one that is completed immediately after treatment. (2007, p. 68,69)

Without this and other necessary information on how the claimed study was supposed to have been performed, we are unable to judge the generalizability, validity and reliability of the model's claims.

NTL Institute's learning pyramid is unsupported by empirical research

A scientific theory consists basically of a model, and a theoretical hypothesis, the latter being a concomitant claim that this model resembles, or somehow "fits" the world (Giere 1997); Scientific theories usually describe and explain parts or specific aspects of the world, like the planetary movements of our solar system, or the structure of DNA. Such models can include scale models, analogue models, and in the case of the learning pyramid; theoretical

models.

The main criterion for evaluating a theoretical hypothesis is whether the model corresponds to the part of reality it is supposed to represent. This is done by deducing an empirically testable proposition, a prediction. A confirmed prediction normally serves as support for the model. On the other hand, if there are other models that could equally well predict the same data, or if the confirmed predictions otherwise offer no real support to the model, the data are deemed inconclusive. Further, a failed prediction may in turn lead to the model being rejected (Giere 1997).

However, there seems to be no empirical support for the claim that the learning pyramid presents a fitting description of learning and retention. In their reply, NTL Institute state that they are unable to present any studies that support their model, and hence fail to fulfill the burden of evidence that follows their claim of the model's empirical status.

Contrary to NTL Institute's history of the model, it has been demonstrated that the learning pyramids have been produced through a synthesis of two separate and untenable ideas (Lalley & Miller, 2007; Molenda, 2004; Subramony, 2003):

The first is a misconstruing of Edgar Dale's "cone of experience", presenting it as a model of learning efficiency. Dale originally presented the model as a visual aid for classifying learning methods according to their level of abstractness and concreteness, and explicitly stated that it was not intended as "a hierarchy or rank order of learning processes". (Dale, 1946, 47). His cone was not describing retention at all, and neither the 1946, the 1954 nor

the 1969 version of the cone contained any numbers.

The second idea stems from an old retention chart. This chart is a set of rates of retention associated with reading, seeing, hearing, saying and doing. These percentages have been traced back to the early 1940s (Molenda, 2004), but we have lately found that they were published several times between 1906 and 1940 (Letrud 2012).

Even though our knowledge of the origin of the percentages of the learning pyramids is incomplete, the NTL Institute's belief in having performed any original research seems somewhat optimistic. Indeed, the retention chart precedes the founding of this institution in 1946 by at least 40 years.

Making predictions from the model

Rejecting a model due to lacking empirical support may be hasty if such evidence in turn may be produced. But in order to test the learning pyramid and to measure the relative efficiency of the learning modes, the model's rudimentary categories need to be thoroughly modified for them to be operationalized. An empirical interpretation of the model in its present state could only be highly arbitrary, and subsequently the learning pyramid of NTL Institute is hardly testable.

Some categories are ambiguous. Consider the sentence "learners retain approximately: 90% of what they learn when they teach someone else/use immediately." The syntax allows for two interpretations that are equally plausible, but only partially consistent with each other: is it adequate to "teach someone

else” or must we “teach someone else immediately” in order to retain 90 percent?

The content of the term “learn” shifts depending on the category. When related to reading, lectures, audiovisual aids, and demonstrations, “being presented with, or acquiring information” seems a plausible interpretation. While in the context of practicing, using and teaching, “learn” apparently takes on a new and different meaning, indicating something along the lines of “processing and understanding information”. In the category “discussion in groups”, “learn” is equally open to both interpretations, since we both are presented with information, as well as contributing our own conceptions and ideas into the discussion.

The difference between “practice” and “use” in the categories “practice what they learned” and “use immediately” is not clear, because these terms are sometimes synonymous. Furthermore, while “practice” can signify repetitions in order to improve one’s performance, or retention of a subject matter, it may also signify the translation of theoretical knowledge into actions or judgments, as in “practicing medicine”.

And finally, what kind of retention does the pyramid describe – long-term, or short-term memory? The category “immediate use” suggests that the aim is to transfer the information from short-term to long-term memory by repetition. The other categories are unclear in this respect.

Even if the model were changed according to these objections, thereby making the model more suitable for testing, it would only produce valid answers to a limited extent:

The categories are, as suggested earlier, not discrete. These ought to be adequately separated and defined, so that they can be examined and evaluated on their own. The claimed 90 percent retention gained by teaching others is in this context paradoxical – because the reason that teachers know the material they teach in the first place, is because they themselves have prior knowledge (Lalley & Miller, 2007) from years of attending lectures, reading, discussions, and demonstrations. They have also been practicing – in both meanings of the word. Hence, their competence is a result of all these low- or semi efficient modes of learning. Even though it is an important motivator, it is far from evident that teaching is a form of learning.

The same critical point can be made of the audio-visual presentations. These often include text, lectures and demonstrations, thereby making it hard to evaluate the impact of audio-visual technology.

These problems might be solved, if the model’s percentages are intended to be additive, and not discrete. However, this interpretation will present major difficulties in separating the effect of the learning methods from the well-known and well-supported effect of repetition.

The intuitiveness of the learning pyramid

But, some might argue, considering the length of time the model has been with us and to the extent it has spread, surely this must indicate that it conveys some essential truths on learning. One cannot help thinking that a major reason why it has spread so efficiently is that it corresponds to all these authors’ scientific knowledge

of education as well as their professional experience.

First of all, even if some experiences of learning come easier to mind than others, the ease of recollection and the vividness of memories of situations where learning took place may not be representative of how we actually learn. For instance, the laborious and tedious process of reading, writing and repeating in order to retain and understand is anything but memorable.

Secondly, it is no wonder that we experience that the model's most efficient forms of learning, discussions, practice, immediate use or teaching others, have made several major contributions to our grasp of different subject matters. They are themselves parts of learning processes that involves attending lectures, reading and writing, and their discrete contribution to these processes cannot easily be distinguished. They can, however, easily be overemphasized.

Thirdly, I have doubts that the authors who reproduce the model adhere to more than one, or maybe two of the categories. There are probably few who have strong feelings concerning the percentages associated with, say demonstrations. Most tend to stress the lower and upper categories, because they find the learning pyramid confirms their general preference for active learning strategies over passive ones, hence resonating with several pedagogical theories that are currently in vogue. And lastly, the burden of evidence is not fulfilled by claiming that the model seems reasonable

Conclusion

NTL Institute's learning pyramid lacks empirical evidence, and any attempt to perform empirical tests of the model will encounter major methodical problems. Despite its inability to stand up to close examination, the model is still corroborated by NTL Institute. The continued distribution of this model cannot be justified, and in order to reduce further dissemination, NTL Institute ought to retract it.

Presentations of other versions of the learning pyramid also need to be confronted with correspondingly critical questions in order to clarify the scientific statuses of these models. If these cannot be adequately satisfied, one should abstain from using them all together.

References

- Booth, C. (2011) "Reflective Teaching, Effective Learning: Instructional Literacy for Library Educators". ALA Editions.
- Borthick, A. F. and D. R. Jones (2000). "The Motivation for Collaborative Discovery Learning Online and Its Application in an Information Systems Assurance Course." *Issues in Accounting Education* 15(2): 181-210.
- Busby, R. S. and J. D. Hubbard (2007). "Using Local Oral History in the Elementary Classroom." *Social Studies Research and Practice* 2(3).
- Chun, A. H. W. (2004). "The Agile Teaching/Learning Methodology and Its e-Learning Platform. *Advances in Web-Based Learning – ICWL 2004*". W. L. e. al. Berlin, Springer-Verlag. 3143/2004: 11-18.
- Dale, E. (1946) "Audio-visual methods in teaching". New York : Dryden Press.
- Dale, E. (1954) "Audio-visual methods in teaching". 2.ed. New York : Dryden Press.

- Dale, E. (1969) "Audio-visual methods in teaching". 3.ed. New York : Dryden Press.
- Darmer, M. R., L. Ankersen, et al. (2004). "The effect of a VIPS implementation programme on nurses' knowledge and attitudes towards documentation." *Scandinavian Journal of Caring Sciences* 18(3): 325-332.
- DeKanter, N. (2005). "Gaming Redefines Interactivity for Learning." *TechTrends: Linking Research & Practice to Improve Learning* 49(3): 26-31.
- Dwyer, F. (1978). "Strategies for improving visual learning: a handbook for the effective selection, design, and use of visualized materials". Pennsylvania: Learning Services.
- Fu, F.-L., R.-C. Su, et al. (2009). "EGameFlow: A scale to measure learners' enjoyment of e-learning games." *Computers & Education* 52(1): 101-112.
- Garden, A. (2009). "How to... teach." *BJOG: An International Journal of Obstetrics & Gynaecology* 116([Supplement s1]): 86-87.
- Giere, R.N. (1997). "Understanding Scientific Reasoning". Belmont: Thomson.
- Hazlett, C. B. (2009). "Prerequisite for Enhancing Student Learning Outcomes in Medical Education." *Sultan Qaboos University Medical Journal* 9(2): 119-123.
- Hoon, T. B., L. Emerson, et al. (2006). "Reforming ESL Writing instruction in tertiary education: The writing center approach." *The English Teacher Association (MELTA)* XXXV: 1-14.
- Janavaras, B. and E. Gomes (2007). "Global Business Research and Strategic Planning Tools." *Journal of International Business and Economy* 8(1): 59-70.
- Janavaras, B. J., E. Gomes, et al. (2008). "Web Based Interactive Software In International Business: The Case Of The Global Market Potential System Online (GMP SO)." *Journal of College Teaching & Learning* 5(4): 23-32.
- Katsuragi, H. (2005). "Adding problem-based learning tutorials to a traditional lecture-based curriculum: a pilot study in a dental school." *Odontology* 93: 80-85.
- Lalley, J. P. & Miller, R.H. (2007): "The learning pyramid: Does it point teachers in the right direction?" *Education* 128(1):64-79.
- Letrud, K. (2012). A search for the origins of an educational myth. (work in progress).
- Magennis, S. and A. Farrell (2005). "Teaching and Learning Activities: expanding the repertoire to support student learning.", AISHE.
- Molenda, M. (2004). "Cone of experience. In A. Kovalchik & K. Dawson (Eds.), *Education and Technology* (161-165). California: ABC-CLIO.
- Morgan, A. L. (2003). "Toward a Global Theory of Mind: The Potential Benefits of Presenting a Range of IR Theories through Active Learning." *International Studies Perspectives* 4(4): 351-370.
- Peteroy-Kelly, M. A. (2007). "A Discussion Group Program Enhances the Conceptual Reasoning Skills of Students Enrolled in a Large Lecture-Format Introductory Biology Course." *Journal of Microbiology & Biology Education* 8: 13-21.
- Peterson, M. W., J. Rowat, et al. (2004). "Medical Students' Use of Information Resources: Is the Digital Age Dawning?" *Academic Medicine* 79(1): 89-95.
- Polovina, S. (11.16.2011). "About the Learning Pyramid". Retrieved from <http://homepages.gold.ac.uk/polovina/learnpyramid/about.htm>
- Qayumi, K. (2006). "Centers of Excellence: A New Dimension in Surgical Education." *Surgical Innovation* 13(2): 120-128.
- Roettger, C. J., L. O. Roettger, et al. (2007). "Teaching: more than just lecturing." *Journal of university teaching and learning practice* 4(2): 119-133.
- Sousa, D. A. (2006). "How the brain learns". Thousand Oaks, California, Corwin.

- Subramony, D.P. (2003). "Dale's Cone revisited: Critically examining the misapplication of a nebulous theory to guide practice". *Educational technology*, 7-8, (25-30).
- Thalheimer, W. (11.3.2006). "NTL continues its delusions." Retrieved from http://www.willatworklearning.com/2006/11/ntl_continues_i.html
- Thier, M. (2005). "Merging Media and Science: Learning to Weigh Sources, Not Just Evidence." *Yearbook of the National Society for the Study of Education* 104(1): 260-268.
- Thomas, M. H. and S. S. Baker (2008). "Nursing the hybrid wave." *Teaching and Learning in Nursing* 3(1): 16-20.
- Treichler, D.G. (1967). "Are you missing the boats in training aids?" *Film and audio-visual communication*, 1, (14-16, 28-30, 48).
- Wagner, N. L., P. J. Wagner, et al. (2005). "Review Article - Distance learning courses in occupational medicine - Methods and good practice." *Indian Journal of Occupational and Environmental Medicine* 9(2).
- Williams, M. R., J. M. Hawes, et al. (2006). "Practice makes perfect: a case study for skill development." *Journal of Selling & Major Account Management* 6(2): 54-61.
- Wood, E. J. (2004). "Problem-Based Learning: Exploiting Knowledge of how People Learn to Promote Effective Learning." *Bioscience education* 3.
- Zainal Abidin, A. (2011). "Remedial Tutorials for Differential Equations." *Journal of Applied Sciences* 11(7): 1231-1236.
- Zhang, H. and H. Su (2007). "Reforming computing education with new web technologies." *Journal of Computing Sciences in Colleges* 23(2): 150-156.