

NO MORE EXCUSES

Studies Conclude Brain-Based Learning is More Effective Than Lectures

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At some level, the corporate training and education communities have bought into the concept of Active, Brain-based or Accelerated Learning. No matter what you call it, the concept is the same—participation is critical to the learning process. Lectures are simply not the most effective vehicle to transfer knowledge.

But a lot of people are still holding out. The reasons are numerous:

- My group is too serious
- My managers don't believe in it
- I need to look professional
- My budget is too tight
- I don't have time

The truth is, Brain-based Learning (BBL) is imperative. Period. And, I'm not just talking about fancy PowerPoint slides. Beside the fact that we have all grown accustomed to smart, creative, savvy, and enticing presentations, specialists of all types—psychologists, brain researchers, social biologists, and learning experts—continue to amass bodies of research that support the assertion that brain-based learning works. So, instead of making excuses, let me take three steps to make it easier for you to use BBL (all of which you can share with managers and participants).

- 1) Share the basic concepts of Brain-based Learning (BBL)
- 2) Share research data that points to the effectiveness of BBL.
- 3) Recommend some easy, low-cost ways to make BBL part of your repertoire.

I. What is Brain-based Learning (BBL)?

Many individuals have written extensively on the concept brain based learning. In addition, universities and corporations have done measured experiments to test

different aspects of this learning theory. In all honesty, it was incredibly easy to get lost in all the research and equally difficult to tease out the most useful and telling data points. So, let me share this synthesis, with the understanding that you might find multiple other layers of information and data if you were to embark on the very same mission.

Lectures are not the most effective vehicle to transfer knowledge

Key Principles of Brain/Mind Learning¹

- The brain is a complex adaptive system.
- The brain is a social brain.
- The search for meaning is innate.
- The search for meaning occurs through patterning.
- Emotions are critical to patterning.
- Learning always involves conscious and unconscious processes.
- Complex learning is enhanced by challenge and inhibited by threat.

Key components of a Successful Learning Environment²

- Relaxed Alertness - High challenge, low threat.
- Active Processing - Hands on, multi-sensory, continual reorganization of information.
- Orchestrated Immersion - Complex true-to-life learning (in which emotions are engaged).

II. Data Points That Support the Use of BBL

While this is by no means an exhaustive list of studies and findings that support the use of BBL, I wanted to share a few highlights:

Facts About Laughter and Relaxed Alertness

These following data points support the notion that teachers and trainers should do all they can to reduce the stress associated with learning new things, in new environments, with new people.

- The mere anticipation of a laugh causes a 27% boost in mood-elevating endorphins.
- One minute of laughing is reported to keep you feeling relaxed for nearly an hour.
- 15 minutes of laughter can burn as many as 50 calories.
- Laughter lowers blood pressure, reduces stress hormones, increases muscle flexion, and boosts immune function by raising levels of infection-fighting T-cells, disease-fighting proteins called Gamma interferon, and B-cells that produce disease-destroying antibodies.
- Stress releases a chemical called TMT* into the brain. TMT disrupts working memory and reduces a person's desire to explore new ideas and creatively solve problems.³
- One of the biggest destroyers of memory is stress. When you are stressed you release high levels of cortisol into your bloodstream. One of the ways that cortisol affects you is that it destroys glucose - the brain's only source of food. So if your brain is not getting the nutrients it needs then it will not function as well.⁴

1 Caine and Caine's, Education on the Edge of Possibility, ASCD, Alexandria, VA 1997.

2 Caine and Caine's, Education on the Edge of Possibility, ASCD, Alexandria, VA 1997.

3 Dr. Kathie F. Nunley, <http://help4teachers.com/>

4 Konstant, Tina, "Teach yourself Speed Reading"

Facts About Active Processing

This collection of facts suggests that student participation, as well as taking breaks, is key to effective learning.

- Active processing includes thinking critically, using the Socratic method, asking probing questions, exploring alternative perspectives and points of view, solving problems, recognizing details, and searching for big ideas and broad implications.⁵

65% of students surveyed stated they prefer to play in teams

- In those experiments involving measures of retention of information after the end of a course, measures of problem solving, thinking, attitude change, or motivation for further learning, the results tend to show differences favoring discussion methods over lecture.⁶
- The amount of information retained by students declines substantially after ten minutes.⁷
- Students hearing the lectures while the instructor paused did significantly better on the free recall and the comprehensive test.⁸
- "If a faculty member allows students to consolidate their notes by pausing three times for two minutes each during a lecture, students will learn significantly more information (Ruhl, Hughes, and Schloss 1987)."⁹

Facts About Orchestrated Immersion

Orchestrated immersion refers to complex true-to-life learning that engages the emo-

tions of learners. True-to-life teaching and learning techniques include, for example, trial and error, role-plays, story telling, and simulations.

- "One must learn by doing the thing, for though you think you know it-you have no certainty until you try."¹⁰
- While there are three different "Learning Modalities" (visual, auditory, and kinesthetic), the Cone of Learning suggests that we learn best by integrating all three. See below. (NOTE: the Cone of Learning is simply a theory. The information is not substantiated with research data).
- Movement is key to linking the right and left sides of the brain. The study quoted below examined the experience of young children. Experimentally, trainers have found the same holds true for adults.
"Movement ties in both hemispheres, allowing [people] almost their only opportunity to apply both sides of the brain to an effort and attempt to pass information between the right and left hemispheres. For

this reason many young children (and older kinesthetic learners) must move to learn. They are able to pay attention and learn only if they are free to wiggle around; sitting still is a strain. Communication between hemispheres begins when a child is about five years old, becomes more effective around age seven (when a child can deal with the abstract), and is fully communicating about age 9-10 for girls and puberty for boys. Until these maturation points, most children are better off employing movement whenever possible to cement learning."¹¹

Facts about Learning Games

- Sherry Robinson of Penn State University reports the findings of her survey in which Net Generation university students were asked about the ideal characteristics of classroom games. Following are the results she shares in an article called "Learning Games from the Ground Up."¹²
 - Approximately 65% of 131 student survey respondents stated that they prefer to play in teams; 20% had no preference; 15% prefer to play as individuals.
 - The most popular size for teams was 3

Cone of Learning

**AFTER TWO WEEKS
We tend to remember...**



Adapted from: **Edgar Dale Audio-Visual Methods in Teaching**, Holt, Rinehart and Winston
(developed and revised by Bruce Hyland from material by Edgar Dale)

5 Caine and Caine, *Education on the Edge of Possibility*. ASCD, Alexandria, VA 1997. p. 12

6 *Teaching and Learning in the Classroom: A Review of the Research Literature* prepared by the National Center for Research to Improve Postsecondary Teaching and Learning (McKeachie, et. al., 1987). P. 70

7 Thomas, J. (1972). The variation of memory with time for information appearing during a lecture. *Studies in Adult Education*, 4, 57-62.

8 Ruhl, K. L., Hughes, C. A., & Schloss, P. J. (1987, Winter). Using the pause procedure to enhance lecture recall. *Teacher Education and Special Education*, 10, 14-18.

9 *Active Learning: Creating Excitement in the Classroom*, by Charles C. Bonwell and James A. Eison, include the following citation: Ruhl, Kathy L., Charles A. Hughes, and Patrick J. Schloss. Winter 1987. "Using the Pause Procedure to Enhance Lecture Recall." *Teacher Education and Special Education* 10: 14-18.

10 Sophocles, 5th c. B.C

11 *The Brain and Learning: Directions in Early Childhood Education*. Marlin Languis, Tobie Sanders & Steven Tipps, NAEYC, Washington, 1980.

12 Published in the Proceedings of the Academy of Educational Leadership, Vol. 12, Number 1. Jacksonville, 2007.

or 4 participants (70% combined).

- 37% gave high importance to competition with a clear winner.
- 24% felt game rules should be strictly followed while the majority stated that allowances should be made.
- 47% preferred games with a mixture of skill and chance.
- 80% preferred some or considerable noise, as opposed to pandemonium or silence.
- At the University of Houston, Lee Revere ran a study on two undergraduate statistics classes. The control group did not use the Jeopardy game as a reinforcement tool between Exams 1 and 2. Revere found that the Jeopardy students showed a 14.3% improvement between exams, whereas the Non-Jeopardy students showed only a 6.7% improvement.¹³
- At Caldonian Business School in the UK, Andy Sharp and Angela Sutherland studied the effect of using Audience Response Systems (ARS) on students' learning. Their study reports that 90.9% of the students surveyed either "Agreed" or "Strongly Agreed" that ARS improved engagement and participation; 81.8% "Agreed" or "Strongly Agreed" that ARS increased their attention span; and 81.9% "Agreed" or "Strongly Agreed" that ARS helped them learn more effectively.¹⁴

Another Worthwhile Fact

"If the objectives of a course are to promote long-term retention of information, to motivate students toward further learning, to allow students to apply information in new settings, or to develop students' thinking skills, then discussion is preferable to lecture (McKeachie et al. 1986)¹⁵.

Research has suggested, however, that to achieve these goals faculty must be knowledgeable of the alternative techniques and strategies for questioning and discussion (Hyman, 1980)¹⁶ and must create a supportive intellectual and emotional environ-

ment that encourage students to take risks (Lowman 1984)¹⁷.

Contradictory Findings

While a great deal of research supports the use of BBL, my search for the data points listed above also revealed a handful of studies and assertions that contradicted these findings. To be fair, in many of the cases where BBL was not proven to enhance learning and memory, the reason seems to have been that the stimuli used to invoke strong visual or emotional memory patterning either overpowered the learning points or were not found to affect long-term memory. In such cases, BBL was not found to have a negative impact on memory and learning, but to have no impact.

As you consider ways to put BBL into action, be warned that the focus of each technique should be learning content, not just improving your "smile sheets."

III. Put BBL Into Action

As you put BBL into action, you need not go overboard in your approach. Begin by trying one or two new approaches and see how they work for your teams.

Here are some impactful and relatively inexpensive ways to put BBL effectively into action.

- Distribute stress toys or fiddles on learners' desks
- Use appropriate humor
- Recognize student accomplishments
- Engage students outside of the classroom
- Encourage students to talk to one another - integrate opportunities for group work into your session
- Ask questions about student viewpoints or feelings - use props to make it easier for participants to share thoughts and feelings
- Employ student-led review sessions
- Play reinforcement games
- Try out some role-playing
- Play audio or video clips and ask stu-

dents to respond to what happened.

- Use Audience Response Systems (electronic systems can tally group results, but low-tech whiteboards can also enable more complete student participation)
- Follow up on topics raised by students even if not directly related to class material
- Have students (or groups) generate test or exam questions
- Have students (or groups) develop a memory mnemonic

For more tools, props, and suggestions I encourage you to spend some time with our catalog at TrainersWarehouse.com. Each of our products is selected because of its purposeful reinforcement of Brain-based Learning techniques.

Facilitate Learning with Participative Games and Playful Tools

Voluminous information and research points to the necessity of using Brain-based Learning techniques to improve the effectiveness of memory and learning.

No matter what your rationale to hold back-your group is too serious, you're unfamiliar with the tools and techniques of Active Learning, your budget is small, your managers think it's unnecessary-it's now time to move forward. Lectures are simply not the most effective vehicle to transfer knowledge, no matter what topic you teach.

When you employ participative games and playful tools in your facilitation of learning, you help your group achieve a state of Relaxed Alertness and Active Processing, which will enable their brains to physiologically retain more new information.

No matter what information you are imparting, trainers can be greatly more effective in delivering messages when students are fully engaged in the learning process. # # #

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800-299-377

13 Revere, Lee, "Classroom Jeopardy: A Winning Approach for Improving Student Assessment, Performance, and Satisfaction, 2003 Instructional Award Competition Finalist, University of Houston-Clear Lake, [Decision Line](#), May 2004.

14 Sharp, Andy & Sutherland, Angela, Caldonian Business School, "Learning Gains ... 'My (ARS)' Theimpact of student empowerment using Audience Response Systems Technolgooy on Knowledge Construction, Student Engagement and Assessment," Release under Creative Commons license <http://creativecommons.org/licenses/by-nc-sa/3.0/> NOTE: the use of the ARS in this assessment was quite rich-toward the end of the 12-week session students had submitted questions for presentation and discussion.

15 [Active Learning: Creating Excitement in the Classroom](#), by Charles C. Bonwell and James A. Eison, include the following citation: McKeachie, Wilbert J., Paul R. Pintrich, Yi-Guang Lin, and David A.F. Smith. 1986. Teaching and Learning in the College Classroom: A Review of the Research Literature. Ann Arbor: Regents of The Univ. of Michigan. ED 314 999. 124 pp. MF-01; PC-05.