How people learn

Robo-teacher has left the building

eLearning was born during the dot-com frenzy. Like many start-up ideas, the first descriptions of eLearning were oversimplified, extreme, and wildly optimistic. Otherwise rational people defined eLearning as putting all learning on computers, as if it had to be all or nothing.

Imagine the savings in plane fare, instructor salaries, and keeping people on the job instead of at the class! Employees could learn anywhere they could plug into the net, whenever you wanted. Learners would save time by studying only what they needed. They would learn at an optimal pace, neither held back nor bypassed by the rest of the class. Cool.

The only problem was that this sort of eLearning rarely worked. Learning is social. Even in the classroom, lots of learning takes informally, between students. Workers learn more at the water cooler or coffee room than during classes.

Learning requires much more than exposure to content. Most people drop out of 100% computer-led instructional events. These same people learn well when computer-mediated lessons are combined with virtual classes, study groups, team exercises, mentors & help desks, off-line events, and on-line coaches.

As the hype cools down, we find that learning hasn't changed; it still requires a variety of activities. Computers can make aspects of learning more convenient but they don't eliminate the need for human intervention. The presumption that eLearning would automate every aspect of learning today seems irresponsible. That dog won't hunt.

The old way of looking at learning:

Teach = Fill their empty heads.

Assess = See what's inside.

Real learning is not what most of us grew up thinking it was. --Charles Handy

The Distance Learner's Guide

I never allowed schooling to interfere with my education. --Mark Twain

Great diagram of the brain

Marc Prensky matches content to learning activity to game styles.

"Distance education should be called 'not-so-distant education.'"

Bill Clinton, Online Learning, October 1, 2001

From the Institute for Research on Learning

Meta-Learning Lab

Learning about learning is occupying my thoughts these days (mid 2001) and I expect to spew lots of ideas on the topic in the next few months. I'm reading Wenger's *Communities of Practice* and enjoying it immensely. *The Mind's Past* has got me thinking about conning the internal con man, the "interpreter" that puts a spin on things to fake us into thinking we're in control and that the world is rational. *The Evolution of Everyday Things* and *Metaphors We Live By* put me in the mood of thinking everything is a variation of something that came before; nothing's *de novo*.

Perhaps the Jungian introvert/extrovert will play into this. As I've personally flipped from introversion to extroversion, I've begun doing more learning by listening to myself interact with others; before, learning was primarily listening to the interal conversation in my head.

Marc Prensky's book, *Digital Game-Based Learning,* has a great list of theories of how people learn:

- Learning happens when one is engaged in hard and challenging activities.
- Learning comes from observing people we respect.
- Learning comes from doing.
- Learning is imitation, which is unique to man and a few animals.
- Learning is a developmental process.
- You can't learn unless you fail.
- Learning is primarily a social activity.
- You need multiple senses involved.
- Learning takes practice, says one. No says another, that's "Drill and kill"
- People learn in context. People learn when elements are *abstracted* from context.
- We learn by principles, says one. By procedures, says the other.
- They can'tt think says the one. They can't *add,* says the other.
- Everyone has a different Learning style."
- We learn X percent of what we hear, Y percent of what we hear, Z percent of what we do.

- Situated learning, says one. Case-based reasoning, says another. Goal-based learning says a third.
  All ofthe above, says a fourth.
- Learning should be fun, peeps the girl in the corner. Learning is hard work, answers another.
- We learn automatically, from the company we keep, says another.
- People learn in "chunks."
- No, "chunking" removes context.

- People learn just in time, only when they need to.

- People learn aurally, visually, and kinesthetically.

There's more going on here than meets the eye.

If you're not into rambling, theoretical musing, skip to here.

For the introverted view...

Learning is changing one's mind by adding new stuff, repudiating old stuff, or by making connections. But how does one change one's mind?

> *Metaphors We Live By* posits that all thoughts are relative. And most are expressed in words. This aligns with the popular wisdom that we learn from stories.
>
> *The Mind's Past* talks about the internal conversation always going on in our heads. Listen for a minute. Yeah, that's it. The book also describes a mediator between the brain and the mind called "the interpreter."
>
> Let's call the subconscious, autonomic brain simply "the brain;" it's attached directly to the senses. The conscious, aware portion of our gray matter, we'll call "mind."
>
> The brain gets sensations first. It rejects most of this sensory input and makes basic decisions about what to do next. Later, "the interpreter" creates a story to provide a rational explanation. The interpreter weaves together a plausible story to bullshit the mind into believing it's rational and in control. In fact, most decisions are made before they enter consciousness.

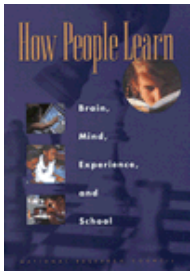
Got that? Your don't make up your mind; your brain makes up your mind. Its interpreter spins yarns the way you do when recounting a dream. A lot more of the brain comes with mechanics "factory-installed" than we like to think. As Bernard Malamud has observed, "All biography is ultimately fiction." Gazzaniga says, "Autobiography is hopelessly inventive."

Changing one's mind consists of convincing the interpreter that the facts of the matter or memories of the past or one's self-image or the rules of the game haved shifted. The changed interpreter puts a different spin on the stories it tells, for those stories must seem internally consistent. The stories must also maintain the fiction that the mind is calling the shots, not the brain.

What might be the nature of this interpreter? Clearly, it needs an image of who its owner is and what the owner is capable of. I'll call this the secret resume, for like a printed resume, it's a very selective and self-serving sense of one's past. The interpreter also needs a worldview or *meme library*, the rules by which things operate. And the interpreter must retrieve memories, for this is the content of thinking. Changing either the secret resume, the worldview, or the memories changes the interpreter's stories. This is learning.

The Mind's Eye tells us that "the brain is not primarily an experience-storing device that constantly changes its structure to accommodate new experience. From the evolutionary perspective it is a dynamic computing device that is largely rule driven; it stores information by manipulating the value of simple arithmetic variables We are a finely honed machine that has amazing capacities for learning and inventiveness. Yet these capacities were not picked up at a local bookstore or developed from everyday experience." They were, as the author says, "factory-installed."

Our brains have a built-in macro library from which they select responses to environmental challenges. "We don't select sentences preformed, like Tickle-Me-Elmo dolls. Rather, we put together fragments to form the whole. So, too, with our thoughts. We think by selecting objects." Our memes are constructed from meme-objects, the grains that add up to a beach of thoughts.



How People Learn: Brain, Mind, Experience, and School, John D. Bransford, Ann L. Brown, and Rodney R. Cocking, editors. "This volume synthesizes the scientific basis of learning. The scientific achievements include a fuller understanding of: (1) memory and the structure of knowledge; (2) problem solving and reasoning; (3) the early foundations of learning; (4) regulatory processes that govern learning, including metacognition; and (5) how symbolic thinking emerges from the culture and community of the learner."

Internet Time Group on eLearners

Learnativity and Marcia Conner's Learning & Training FAQ. How adults learn.

Ellen Langer's *The Power of Mindful Learning* profoundly shaped my thinking about how to improve education. Absolute truth is a fantasy. Look at things from different points of view. Change your approach, improve your learning.

Implementing The Seven Principles of Good Practice
How do people learn?, Funderstanding
Constructivism, behaviorism, multiple intelligence, observation, etc. Simple -- but you gotta start somewhere.
The Neurobiology of Memory & Learning

Learning Styles Site, Indiana

Bloom's Taxonomy
Methods of Delivery

"I hear and I forget. I see and I remember. I do and I understand." -Confucius

Learning & Instruction: Theory Into Practice Database 50 major theories of learning and instruction

"If I hear and see and do and teach and practice, I understand even better." -Jay

Learner-Centered Psychological Principles: A Framework for School Redesign and Reform, American Psychological Association, Board of Educational Affairs (BEA) 11/97. Maybe.

Information is not instruction.

Distance Learning Professional Development Model

People learn best when they...

- Know what's in it for them and deem it relevant
- Have mastered the prerequisites
- Understand what's expected
- Connect with other people
- Are challenged to make choices
- Feel safe about showing what they do and do not know
- Control the pace, navigation, and delivery
- Use a process that matches their preferred learning style
- Receive information in small packets
- Receive frequent progress reports
- Learn things close to the time they need them
- Receive encouragement from coaches or mentors
- Learn from a variety of styles (say, discussion followed by a simulation)
- Confront maybes instead of certainties
- Teach others
- Receive positive reinforcement for small victories
- Screw up

"Spoon feeding in the long run teaches us nothing but the shape of the spoon." -E. M. Forster

"One's mind, once

- Try, try, and try again
- Just do it

Lee and Bowers (1997) studied a group of university students to determine under which set of conditions people learned best. The participants were given a pre-test, they then learned the material, and then were given a post-test. Their learning was compared with the learning of a control group that took the same pre- and post-tests, but studied a different topic in-between. When compared with the learning performance of the control group, the people in the different groups always demonstrated more learning:

Hearing spoken text and looking at graphics ? 91% more learning,
Looking at graphics alone ? 63% more,
Reading printed text plus looking at graphics ? 56% more,
Listening to spoken text, reading text, and looking at graphics ? 46% more,
Hearing spoken text plus reading printed text ? 32% more,
Reading printed text alone ? 12% more,
Hearing spoken text alone ? 7% more.

Excerpts from the LiNE (Learning in the New Economy) Zine Manifesto, Brook Manville and Marcia Conner (6/2000).

- Metrics of success for the new learning will be traditional financial and performance measures, not fancy, academic concepts.
- Speed and performance demands in the New Economy will shift starting assumptions from just in case generic to just in time personalized learning—and that's just fine.
- eLearning will grow in importance, but will be only one part of the rich mix of choice and mass personalized approaches to learning required by knowledge workers.
- The distinction between formal and informal learning will and should evaporate.

21st Century Learning Initiative publishes wonderful, provocative, leading-edge white papers and articles on education, primarily K-12 in the UK but universally applicable.

Some Principles of Educational Reconstruction, Roland Meighan
"Effective teaching requires much more than being an instructor: welcome the 'learning coach' and the 'learning travel agent'."

Battery Hens or Free Range Chickens?, John Abbott

stretched by a new idea, never regains its original dimensions."
-Oliver Wendell Holmes

"Teachers open the door, but you must enter by yourself."
-Chinese Proverb

"Prosperity is a great teacher; adversity a greater.'
-William Hazlitt

"I have learnt silence from the

talkative, toleration from the intolerant, and kindness from the unkind; yet strange, I am ungrateful to these teachers."
-Kahlil Gibran

"You see learning has to do with a hunger to make sense of something. The whole brain, including the emotions, has to be engaged. If you separate emotion from intellect you court disaster."

Headteachers' Course (1999-2000). "New understandings about the brain; about how people learn; about the potential of information and communication technologies; about radical changes in patterns of work, as well as increasing economic inequality and social divisions within and between nations, necessitate a profound rethinking of the structures of education."

How We Want to Live Tomorrow, Portal on Global Digitalization
Enterprise Training: Helping Executives Get It (5/99) *Datamation*

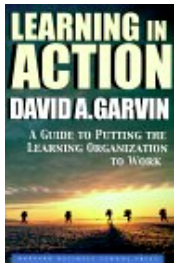
Futurework: Trends and Challenges for Work in the 21st Century. loaded with stats. (Department of Labor)
The Educators Manifesto Renewing the Progressive Bond with Posterity through the Social Construction of Digital Learning Communities, (1999) Institute for Learning Technologies, Columbia University
Education and the Mind (1999) by Carl Bereiter
Learning Outcomes, Center for Curriculum, Transfer and Technology
A narrow view of how the American public school system got so screwed up

Distance learning is no less effective than traditional means, the "*No Significant Difference Phenomenon*".

Review of Cliff Stoll's *High-Tech Heretic*: *Why Computers Don't Belong in the Classroom and Other Reflections by a Computer Contrarian* (and crank)

in *Learning in Action*, David Garvin posits four preconditions for learning:

1. openness to new perspectives (the provisional nature of knowledge)
2. awareness of personal biases (we see what we want to see)
3. exposure to unfiltered data (not watered-down interpretations)
4. humility (don't have all the answers)



these are really the same thing stated four times. essentially, "the truth is not out there." everything flows. nothing is certain. meaning is defined by context, and context is forever subject to redefinition. our senses are untrustworthy. what we see isn't really there. it's a construct, a creation of our mind. (consider the bandwidth required to pull in a high-res movie of what's going on around us.) bias (filtering) warps everything we experience.

this uncertainty challenges the individual to refine and

internalize his or her take on things relative to his/her environs. this is what learning is - mapping a subject's relative position. this ties right in to the mindfulness work of langer: tell 'em it's uncertain and they learn more that if you tell 'em it's absolute truth.

Metaskills

Critical Reading and Effective Writing

Deepening Our Understanding of Essential Abilities

Highlights from Syllabus Magazine
Changing the Interface of Education with Revolutionary Learning Technologies

The Five Fundamental Learning Styles for Online Asynchronous Instruction

Apprenticeship	Incidental	Inductive	Deductive	Discovery
A “building block” approach for presenting concepts in a step-by-step procedural learning style.	Based on “events” that trigger the learning experience. Learners begin with an event that introduces a concept and provokes questions.	Learners are first introduced to a concept or a target principle using specific examples that pertain to a broader topic area.	Based on stimulating the discernment of trends through the presentation of simulations, graphs, charts, or other data.	An inquiry method of learning in which students learn by doing, testing the boundaries of their own knowledge.

Learning and involvement

Learning requires engagement. Methods of engagement include:

1. Presenting information as tentative, which asks the learner to engage in assessing its veracity.

2. Offering opportunities to compare one's views to those of others. "18% of Americans feel public money should not be 'wasted' on art."

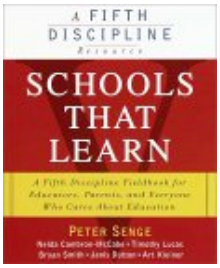
3. Feeding back information from a group of peers. "In a poll, 32% of you professed to never have seen porn on the web."

4. Providing challenges that call on one's exformation. "Exegesis means (a) pulling a tooth, (b) tracking feedback, (c) assembling unrepresentative cases to

support one's argument -- what Nietsche often did, or (d) disinterring a body from the grave." Go ahead, take a guess. The answer is here.

5. Making connections to other contexts, e.g. You want to learn to fly. Let's compare flying to driving a car. Your mind begins mapping the differences and similarites.

Schools That Learn



by Peter Senge et alia.

A Fifth Discipline Fieldbook for Educators, Parents, and Everyone Who Cares About Education

I read the Orientation and Primer to the Five Disciplines thoroughly. This book is 600 pp. and I was only interested in the parts that apply to adults as well as children. I flipped through the sections on Classrooom, School, and Community, sampling whatever appealed to me, perhaps a third of what was there. My reading chairs were provided by Southwest Airlines and Frontier, so distractions were few but sleep was an ever-present temptation.

Everyone remembers a "special connection" with their early teacher, a moment of respect, pride, and learning. Pity they aren't more common. Our schools are obsolete and we need to re-create them to serve students who will grow up in a post-industrial world.

The five "disciplines" are ongoing bodies of study and practice that people adopt as individuals and groups. I think of them as touchstones for Senge followers. Examples throughout the book identify which discipline(s) apply. The big five are:

1. **Personal mastery**. Knowing who you are and where you want to go. This creates a personal gap awareness.

2. **Shared vision**. Commonality of purpose.

3. **Mental models**. Reflection and inquiry skills. I expected to find some nifty algorithms and rules of thumb. This is the least well-developed "discipline." The recurring model is the "ladder of inference." It's important to reflect with models because "in any new experience, most people are drawn to take in and remember only the information that reinforces their exsiting mental models."

4. **Team Learning.** This is conversation, dialogue, discussion...what I call community.

5. **Systems thinking**. Taking a holistic approach, understanding interdependencies, feedback, and complexity.

All learners construct knowledge from an inner scaffolding of their individual and social experiences, emotions, will, aptitudes, beliefs, values, self-awareness, purpose, and more. In other words, if you are learning in a classroom, what you understand is determined by how you understand things, who you are, and what you already know as much as by what is covered, and how and by whom it is delivered.

Senge gives a marvellous rif on the industrial-age heritage of schools. The world as a clock (Kepler, Descartes, Newton), an assembly of parts. Fred the great, fascinated by mechanical toys, wanted soldiers to perform as interchangeable parts. Industrial organizations bought the military model (hence, line and staff, chain of command, training). From 1770 to 1812, labor productivity increased 120 times over in the British textile industry. Schools took up the methods of the assembly line. Like any assembly line, the system was organized in dscrete stages (grades). Uniform speed (bells, schedules, fixed curriculum). The school factory was separate from daily life.

Human reason is a form of animal reason, a reason inextricably tied to our bodies and the peduliarities of our brains." Human cognitive development involves just as much "body knowledge" as it does "mind knowledge." Maturana and Vella: "All doing is knowing and all knowing is doing."

Life's interdependencies tend to remain invisible to the fragmented academic theory of knowledge. Reality is composed fundamentally of relationships, not things. (Somewhere today I read that "The most important things in life are not things.")

autopoesis = self-producing
double-loop learning = thinking about how you think, i.e. metareflection

Schools That Learn didn't meet my objectives. Great stuff for fixing up schools but not that useful for reconceptualizing adult learning. It also put me to sleep several times as I entered the land of diminishing returns.

Amazon's got 50 pages of the book for free.

From earlier notes, while reading the first section from a library copy of the book:

- Knowledge is constructed, not transferred. It's built out of known chunks. It's always linked to the situation, thus "situated." Skills and knowledge do not exist outside of context. Everything is connected, in mental, physical, or social space.
- Learning = constructing mental models. Bootstrap these by making them objective and analyzing
- There are no empty vessels. Beware of fragmentation and malrules (buggy algorithms).
- "The search for teachable, general learning abilities is as old as the history of education."

The answer is "C". Both Nietsche and I are guilty of using exegesis to make our cases. BACK

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