

Curtin University  
School of Design

Internet Interactivity Design 392

Chapter 1

**Learning Styles**

By  
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## Learning Styles:

**Behaviorism**: A theory of animal and human learning that focuses only on objectively observable behaviors, and discounts mental activities. ***Learning is defined as nothing more than the acquisition of new behavior.***

1. Classic conditioning involves the natural reflex that responds to a stimulus.
2. Behavioral or operant conditioning involves the reinforcement of the response of the stimulus. A ***simple feedback system, popular with animal trainers*** — but used on humans as well. (Pavlov's dogs)

Can you think of any examples where behaviorism is applied to people? (stress test game room, insomnia quiz). Should stay consistent in treatment.

**Cognitive Model of Learning**: Knowledge resides in the learner's head in the form of a ***mental model***. Learning happens when the learner acquires new information (*accretion*), integrates that information into their existing knowledge structure or mental model (*restructuring*), and then *retunes* their way of thinking. (Relevant to 4Mat's first quadrant.) Stress site, Astrology site.

1. Accretion
2. Restructuring
3. Tuning

**Constructivism**: A philosophy of learning that is founded on the premise that we all construct our understanding of the world we live in, through ***reflection on our experiences***. (Also relevant to 4Mat's first quadrant.) lao.soap.skool, therein.

1. Learning is a search for meaning.
2. Meaning requires understanding wholes as well as parts
3. In order to instruct or teach well, we must understand our students ***mental models***.
4. ***The purpose of learning is to construct one's own meaning, not to have the "right" answers by repeating someone else's meaning.*** [An observation from Joel: A lot of students have this problem when submitting assignments. I've even noticed it when it comes to enrolling in my units using the online registration comments field!]

There are plenty of ways to teach, but there is one that seems to lend itself very well to the interactive design requirements of this unit. Think of this as a formula for designing your final project in this unit:

Dr. David Kolb's 4Mat Constructivistic Model:

Learning Styles: We all have our preferred ways to learn something. When catering instruction to a large group, it is important to make sure everyone's needs are addressed. (see [aboutlearning.com/4mat](http://aboutlearning.com/4mat))

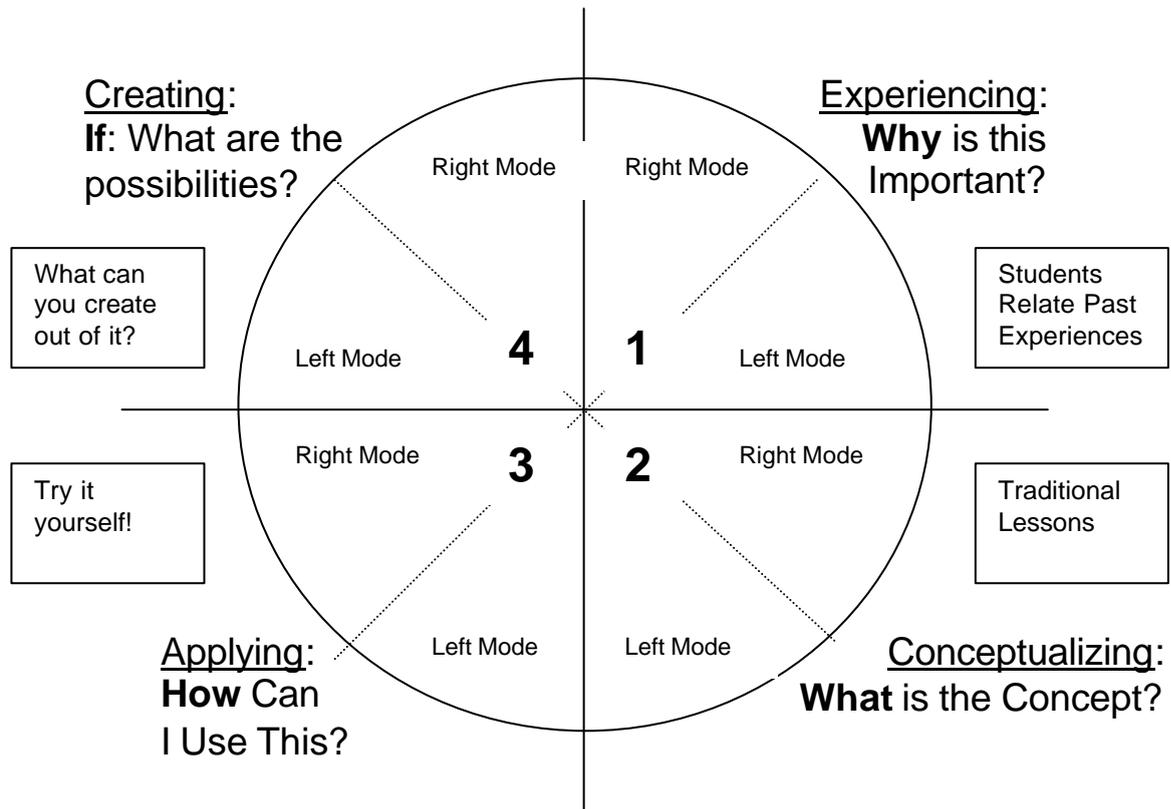
- We perceive experience and information in different ways (Sensing/Feeling or interacting vs. Thinking by yourself). Which do you respond better to?
- We process experience and information in different ways (Acting vs. Watching). What are your preferences? (some theorize that students won't learn unless you pull them out of their comfort zone and make them interact with others -- Why some teachers call on students)
- The combinations formed by our own perceiving and processing techniques form our unique learning styles.

Those combinations result in four major, equally important learning styles:

1. Those learners who are primarily interested in personal meaning. Instructors need to create a reason. (***Why are we learning this? What does this have to do with me?***)
2. Those who are primarily interested in facts as they lead to conceptual understanding. Instructors need to give students facts that deepen understanding. ***Traditional teaching style.***
3. Those who are primarily interested in how things work. Instructors need to let them try it. ***Participation and Interactivity!!***
4. Those who are primarily interested in self-discovery. Instructors need to let them teach it to themselves and others. ***Let students build from scratch to discover non-taught things.***

***Although students will prefer some of these four styles over others, the 4MAT system believes it is important that they are taught in all four ways to cater to everyone.***

If you design on the Web, think about how you can inspire people with different learning styles to learn something from your site. Instead of just designing for the kinds of people who would normally be interested, think about how you can get a wider audience without alienating your original group. See [sycamore.forest.net/learning/](http://sycamore.forest.net/learning/) for lesson plan examples



**Quadrant 1:**

Quadrant One is meaning. Look at the activities list, what jumps out as the experience that will make a connection for learners? An experience that will call forth past feelings and have meaning today? What classroom experience will bring the value of the content right into the moment?

- Why does the learner need to know this?
- What value does it hold?
- How does this connect to his or her world?

**Quadrant One, Right Mode**

Objective: To Create an Experience.

Some Activity Suggestions:

- Connect students directly to the concept in a personal way
- Begin with a situation that is familiar to students and builds on what they already know.
- Construct a learning experience that allows diverse and personal student responses.

**Quadrant One, Left Mode**

Objective: Examine the Experience.

Some Activity Suggestions:

- Guide students to reflection and analysis of the experience
- Summarize and review similarities and differences between various experiences
- Clarify the reason for learning

**Quadrant 2**

Quadrant Two is knowledge. What is the best way for learners to become informed as to this content? Will it be text, audio, videos, or some combination of these elements?

- What exactly is the learner to understand by examining this content?
- What is the "expert knowledge?"

**Quadrant Two, Right Mode**

Objective: Integrating personal experiences into conceptual understanding.

Some Activity Suggestions:

- Provide a metaview, lifting students into a wider view of the concept
- Use another medium to connect students' personal knowledge to the concept
- Deepen the connection between the concept and its relationship to the students' lives
- Relate what the students already know to what the experts have found.

**Quadrant Two, Left Mode**

Objective: Define theories and concepts

Some Activity Suggestions:

- Emphasize the most significant aspects of the concept in an organized, organic manner
- Present information sequentially so students see continuity
- Draw attention to important, discrete details; don't swamp students with myriad facts
- Use a variety of media to deliver the message.

**Quadrant 3**

Quadrant Three is skills. What are the most important skills necessary to complete the work in this unit? Are you keeping some learners from mastery by asking them to be more skilled than they presently are without supplying the help they will need to do this?

- How does the learner master these ideas and apply them in the real world?
- How does the learner "add something of himself" to the new material, interpreting, extending?

**Quadrant Three. Left Mode**

Objective: Reinforcing and Manipulating Defined Concepts

Some Activity Suggestions:

- Provide hands-on activities for practice and mastery
- Set high expectations for skills mastery
- Determine if re-teaching is necessary.

**Quadrant Three. Right Mode**

Objective: Adding something of themselves.

Some Activity Suggestions:

- Encourage tinkering with ideas/relationships/connections
- Require students to organize and synthesize their learning in some personal, meaningful way

### **Quadrant 4**

Quadrant Four is performance. What will learners need to do? What kind of behavior, action, performance is required? Think of the outcomes, and the best ways for learners to achieve them. Think also of options, remember the diverse ways in which students learn and try to honor them.

- If learning happens, what will they have a better chance of becoming?
- What are the creative manifestations of this newly-learned material?

### **Quadrant Four, Left Mode**

Objective: Evaluating for Usefulness and Application

Some Activity Suggestions:

- Give guidance and feedback to students
- Help mistakes to become learning opportunities
- Summarize by reviewing the whole, bringing students "full circle" to the experience with which the learning began.

### **Quadrant Four, Right Mode**

Objective: Doing it themselves.

Some Activity Suggestions:

- Leave students wondering (creatively) about further possible applications of the concept, extending the "what ifs" into the future.

**Quadrant 1**      *People in Quadrant One typically have Careers like counseling, teaching, organizational development, humanities, and social sciences.*

**Quadrant 2**      *People in Quadrant One typically have Careers like Mathematicians, research and planning, and natural sciences.*

**Quadrant 3**      *Typical Careers include engineering, applied sciences, and surgeons.*

**Quadrant 4**      *Typical Careers include marketing, sales, entertainment, education, and social professions.*

### Other Learning Preferences: Left and Right Brained People

In addition to the 4 quadrants Dr. Kolb advocates, people are also believed to either use the right side or left side of their brains more than the other.

Your brain resembles two halves of a walnut, connected at the center. The two halves are called your “left hemisphere” and your “right hemisphere”.

The human nervous system is connected to the brain in a crossed-over fashion. The left hemisphere controls the right side of the body and visa versa. (Right hand controlled by left brain, etc...)

Unlike animals, humans develop their two brain halves asymmetrically (or independently). The most noticeable outward effect of this asymmetry of the human brain is handedness. Ever known of an animal to be right-pawed? Most animals are more ambidextrous than humans.

For over 150 years, scientists have known that the function of language and language-related capabilities is mainly located in the left hemispheres of the majority of individuals: 98% of those right-handed, and 66% of those left handed. They’ve known this because an injury on the left side of the brain is more likely to cause a loss of speech than a similar injury on the right side of the brain.

Because language skills, the skills that set humans apart from animals, were found in the left side of the brain — the left side became known as the major, more important side, of the brain while the right side has traditionally been seen as a subordinate, less-advanced, minor hemisphere.

As you know, there is a bias towards being right handed. In Western societies, the right hand is strongly connected with what is good, just, moral, and proper. The left hand is strongly linked with concepts of anarchy, as well as bad, immoral, and dangerous feelings. Many parents have tried to force their left-handed children to use their right hands — a practice that often caused problems lasting into adulthood. (Incidentally, most of us show a preference for one hand, eye, or foot, than the other — not a 100% dominance).

The Latin word for left is “sinister”, meaning “bad”, “ominous”, “sinister”. The Latin word for right is “dexter”, from which comes the word “dexterity”, meaning “skill” or “adroitness.” The French word for left means “awkward”. The English origin of the word “left” means “weak”, or “worthless”.

How many other cultural sayings or customs can you think of that reflect this kind of thinking?

Do you think the education system in Australia is focused on the left side or right side of the brain?

This repression of the right side of the brain has forced us to avoid using our creative side. It is often seen as childish to be creative.

Most of us have a connection between these two hemispheres, which allow from some crossover. In a manner of speaking, each of us has two minds, two consciousnesses, mediated and integrated by this connecting cable of nerve fibers between our two hemispheres. Left handed people tend to have more of a crossover than right-handed people (for some reason).

Sometimes our brains work better using both hemispheres, sometimes they work better using just one. Try to describe a spiral staircase using just the left-side of your brain (without using your hands — that would be your right side “illustrating”).

Many artists find it easier to draw if they learn to turn off the left side of their brain while they are drawing.

### Left Brain / Right Brain Characteristics

- Left-mode activities are objective, sequential, analytical, and verbally expressive.
- Right-mode activities are subjective, synthesizing, metaphorical, and nonverbal.

Furthermore, students use different processing techniques to understand information, based on their inclination to the left-side or right-side of their brain.

<b>Left Mode</b>	<b>Right Mode</b>
<u>Verbal</u> — Using words to describe and define	<u>Nonverbal</u> — Awareness of things, but minimal connection with words.
<u>Analytic</u> — Figuring things out step-by-step and part-by-part	<u>Synthetic</u> — Putting things together to form wholes (getting the bigger picture)
<u>Symbolic</u> — Using a symbol to stand for something (artists using their left brains make the mistake of doing this in their drawings).	<u>Concrete</u> — relating to things as they are at the present moment.
<u>Abstract</u> — taking out a bit of information and using it to represent the whole thing. Jump to conclusions?	<u>Analogic</u> — Seeing likenesses between things; understanding metaphoric relationships. More likely to relate to icons than words. Netscape’s buttons have both.
<u>Temporal</u> — Keeping track of time, sequencing one thing after another.	<u>Nontemporal</u> — Without a sense of time. Like to lose track of time.

Doing first things first and second things second.	
<u>Rational</u> — Drawing conclusions based on reason and facts.	<u>Nonrational</u> — Not requiring a basis of reason or facts; willingness to suspend judgement. More tolerant of differences in others and things? Don't mind Bizarre navigation?
<u>Digital</u> — Using numbers as in counting.	<u>Spatial</u> — Seeing where things are in relation to other things, and how parts go together to form a whole. Appreciate negative space and white space.
<u>Logical</u> — Drawing conclusions based on logic: one thing following another in logical order — for example, a mathematical theorem or well-stated argument.	<u>Intuitive</u> — Making leaps of insight, often based on incomplete patterns, hunches, feelings, or visual images.
<u>Linear</u> — Thinking in terms of linked ideas, one thought directly following another, often leading to a convergent conclusion.	<u>Holistic</u> — Seeing whole things all at one; perceiving overall patterns and structures often leading to divergent conclusions.

Most of us are either more left-brained than right-brained, or more right-brained than left brained. Some of us use both sides of our brains equally.

Traditional teaching has focused on only the left-side of Step #2.

Artists tend to use more of the right side of their brains.

Some feel Designers should use both side equally:

- Left for developing Functions
- Right for developing Forms

Info about research done on the two sides of the brain:

Evidence has accumulated that shows that while the left side of the brain is verbal and analytical, the right side of the brain is non-verbal and global. The mode of processing by the right brain is rapid, complex, whole-patterned, spatial, and perceptual — processing that is not only different from, but as complex as the analytical processing done by the left side of the brain.

Most people with normal brains have their two hemisphere's connected by the "Corpus Callosum". There have been studies done on people who have had

this section of their brain disabled so there was no cross-over that have revealed very information on how our two hemisphere's function differently:

These patients were asked to sit in a booth and focus on a central point on the wall where researchers would flash different images for each eye at the same time quickly enough to prevent both eyes from scanning both of them. If a researcher asked the patient what they saw in their right eye (with their left brain), they had no problem answering the question. But if researchers asked patients what they saw with their left eye (and right brain), they most likely stated what they saw with their right eye (but immediately realizing they were wrong). If they were asked to reach behind a curtain and pick out what they has seen, they had no problem finding the object they saw with their left eye.

Other tests have shown these same patients were far better at constructing puzzles with their left hands (right brains) than their right hands (left brains) — to the point of sitting on their right hands to keep them out of the way.

#### Stats about left handed people...

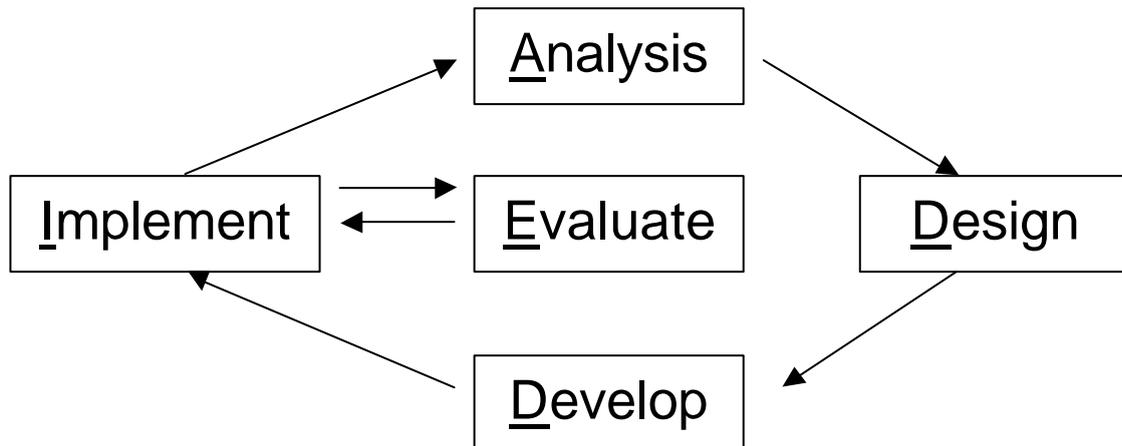
Since lefties or more likely to mix up the location in their brain where they process information, they're

- More prone to stutter
- More likely to experience dyslexia

At the same time, they

- Have a much easier time reading mirrored words
- Excel in math, music, and chess, ....and art??...

Leonardo da Vinci, Michelangelo, and Picasso were all left-handed. (There is no proof of this related to left-handedness, but there is a belief that those with a less segregated brain — which is a characteristic of left-handedness — are better artists).

**ADDIE Model (Review)**

**Analysis:** Identification of the problem

- What's the problem?
- What's causing the problem?
- Who are the learners or audience?
- What outcomes are wanted?
- What are the objectives?

**Design:** What needs to be done to deliver the content?

- What content should and should not be included?
- What steps of instruction are required?
- What types of media should be used?
- Make Flowcharts
- Make Storyboards

**Development:** How to best instruct using design constraints

- Make a Prototype
- Author Markup Language
- Author JavaScript
- Testing

**Implementation:** The delivery of the instruction itself

- Uploading Web Pages
- Debugging Web Pages
- Marketing Site
- Collecting Statistics on Users' Behavior

**Evaluation:** Informal and Formal Assessments

- Continuous throughout entire process
- Evaluate Statistics Collected on Users
- How much and how well did students learn?
- How well did the workshop, course, or tutorial work?
  - Does it need to be modified to be given again?
  - What needs to be changed?

- The Content?
- The Steps of Instruction?
- The Media of Representations of Content Used?

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**References**

Edwards, B. (1989) *Drawing on the Right Side of the Brain*, Penguin Putnam, New York, NY  
Kolb, D. (2000) *About Learning*, Available Online: <http://www.aboutlearning.com/>