

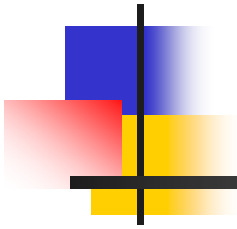
Learning Styles/Teaching Styles

How Students Learn
and

What We Can Do to Help

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Theoretical Underpinnings to Learning Theory and Its Application to Use in the Engineering Classroom

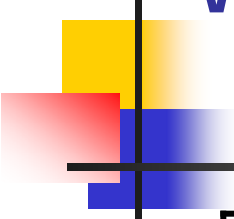
- Learning Theory has been a matter of speculation from the Ancient Greeks to the Present Day. Plato, famed for his ability to think through a situation and make incorrect conclusions about it, believed that learning was achieved by a transmittal of sound through a physical vapor to the ear, which received the sound like an echo in a cave and entered the head where it could be processed through a logical process of processing each individual sound and adding those sounds up into intelligible phrases that the mind, ever open to receiving those vaporous noises, can contemplate and store into boxes arranged throughout the head where the information could be retrieved and reprocessed in a spontaneous and liquid manner to convey the information to pupils.
- Can you hear me now?



How Do You Learn?

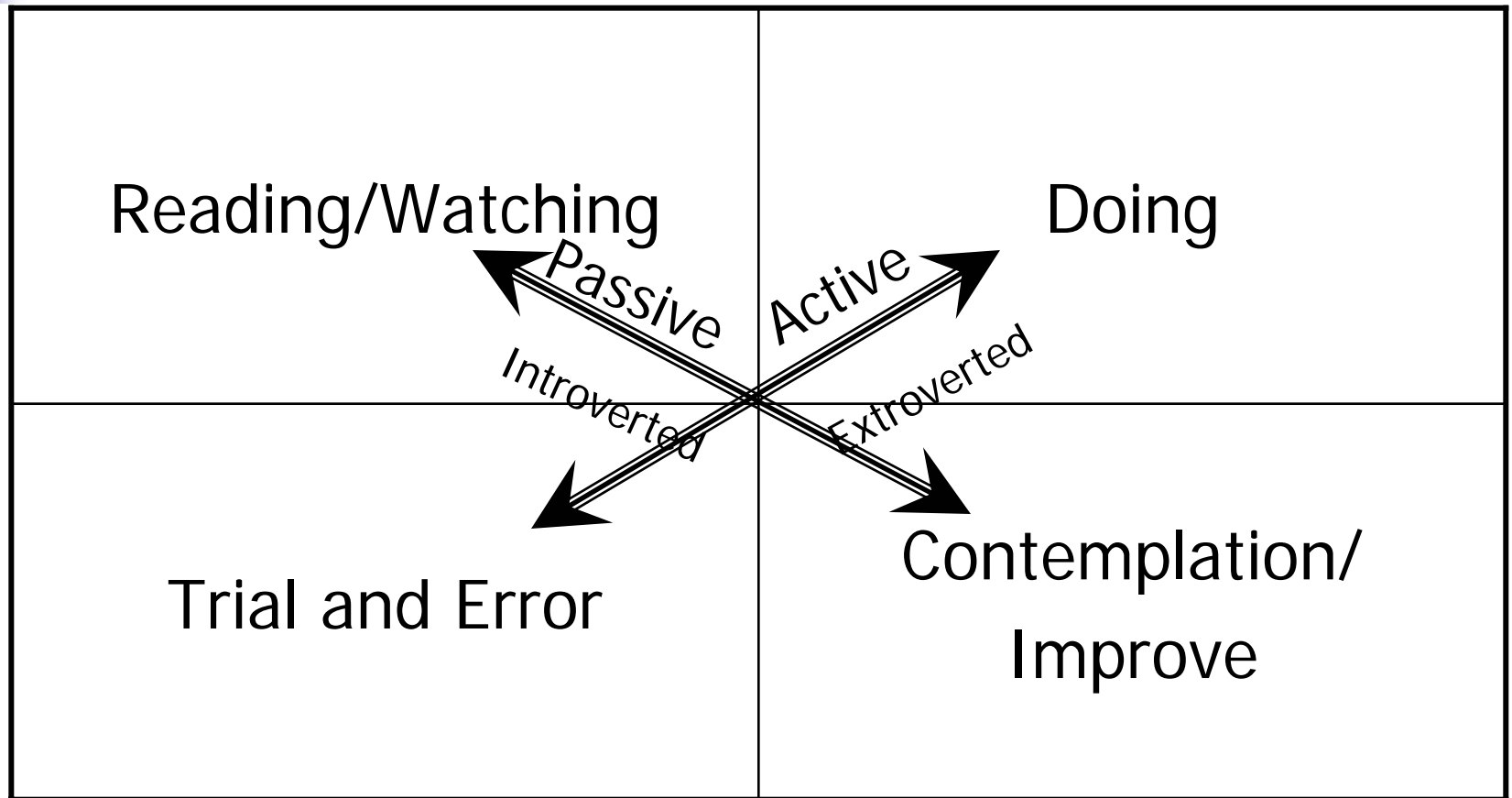
- This is a question that is often asked and certainly fits with the topic.... but
- This is not a Rhetorical Question!!!
- How Do YOU Learn?
 - Pick a Topic – A Hobby, A Technical Topic, An Investment.....
 - What are all the ways you learn about it???

What do We Gather from That?



Reading/Watching	Doing
Trial and Error	Contemplation/ Improve

What do We Gather from That?





Hobbies and Preferences

- I like talking about hobbies because a hobby is selected through personal preference.
- Preferences are developed from infancy on.
 - Nature vs. Nurture
- Our Preferences define our Personality



Karl Jung - Psychological Types (1924)

- Two Primary (Conscious) Functions –
 - Perceiving (Learning)
 - Sensing
 - Intuition
 - Judging (Synthesizing or Evaluating)
 - Thinking
 - Feeling
- Attitude
 - Orientation (Relationship to the World)
 - Extrovert
 - Introvert



Isabel Myers and Katherine Myers Briggs Myers-Briggs Type Indicator (MBTI)

- Attitude
 - Extrovert (E) vs. Introvert (I)
- Perceiving
 - Sensing (S) vs. Intuition (N)
- Judging
 - Thinking (T) vs. Feeling (F)
- Lifestyle (Myers-Briggs)
 - Judging (J) vs. Perceiving (P)



MBTI - Perceiving

- Sensing

- See
- Feel
- Taste
- Hear
- Smell
- Practical
- Labs
- Physical Projects
- Manipulatives
- Sequential
- Trees
- Deductive Learning

- Intuition

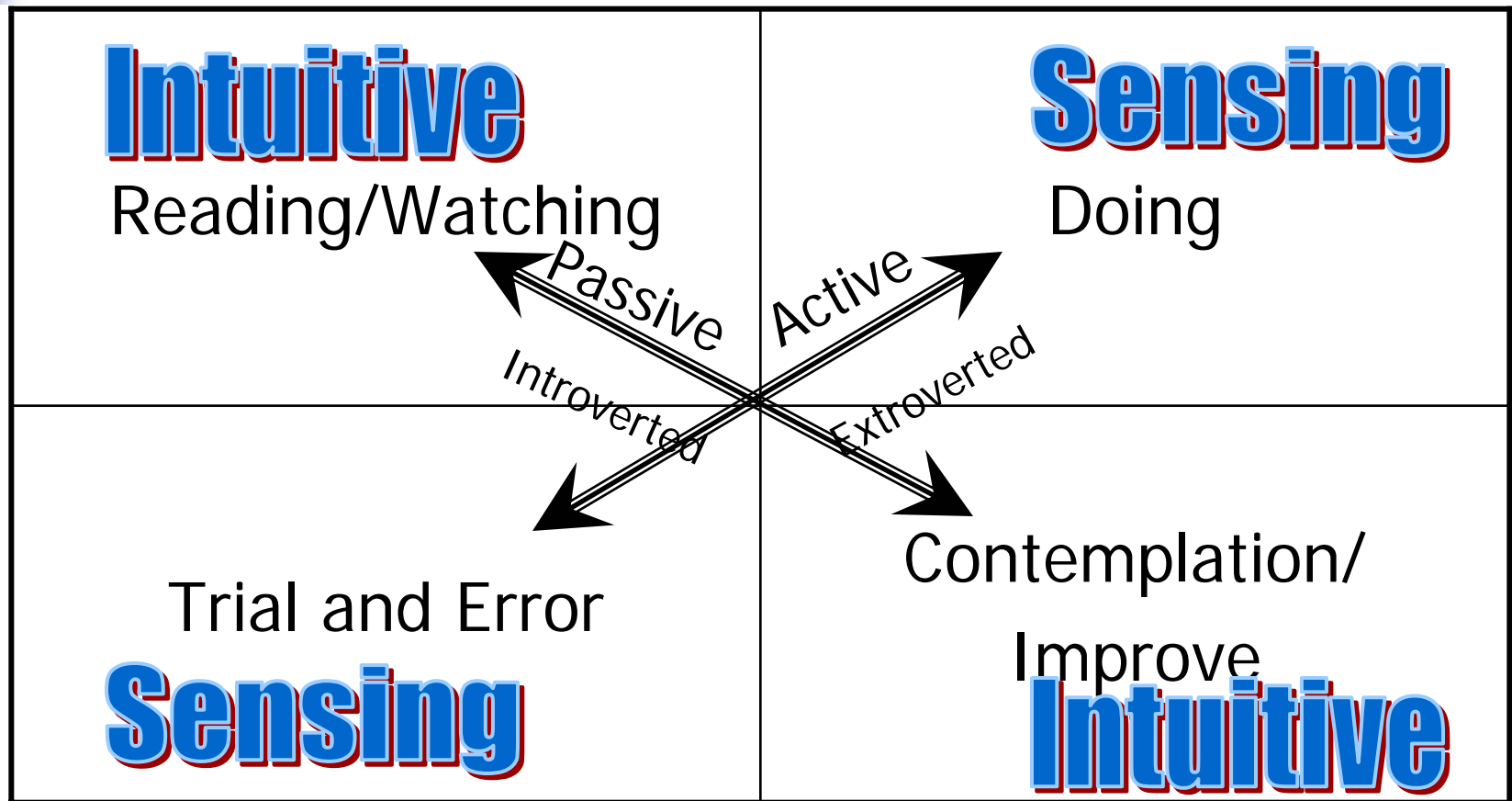
- Concept
- Hunch
- Overview
- Global
- Mental/Head
- Reading
- Theoretical
- Watching
- Reflection
- Contemplation
- Forest
- Inductive Learning



MBTI - Judging

- Thinking
 - Cause and Effect
 - Logical
 - Factual
 - If/Then/Else
 - (Visualize to me)
 - Black and White with Shades of Gray
 - "Thing Oriented"
 - Types of Jobs?
- Feeling (Not Emotional)
 - Subjective
 - Personal
 - Use C/E, Logic, Facts but final decision is with effect on people
 - (Visualize to me)
 - Black and White with Shades of Color
 - "People Oriented"
 - Types of Jobs?

What do We Gather from That?





My Experience with Mainly Civil/Architectural Students

- Typically
 - 65% Sensing, 35% Intuitive
 - 70% Thinking, 30% Feeling
 - 35% Extroverted, 65% Introverted
 - 50% Judging, 50% Perceiving
- Somewhat different ratios for other disciplines
- University Faculty 25% - INTJ (n-150)
- Engineering Faculty 50%+ - INTJ (n-10, exp.)



Consequences of Teaching/Learning

- We often teach like our favorite teachers.
- We typically select favorite teachers because they teach to our preference.
- Therefore, The Students that Learn Best from Us are those Most Like Us.
 - (Easy to shoot lots of holes in that statement, but I believe that the underlying truth is correct.)
- The Students that are Least Like Us are the ones that Do the Worst.
 - (A weaker statement but reflectively true.)
- However, people of all types are successful engineers.
- Diversity of thought produces the most creative solutions.
 - (Really important concept!!!)



Other Learning Style/ Teaching Style Models

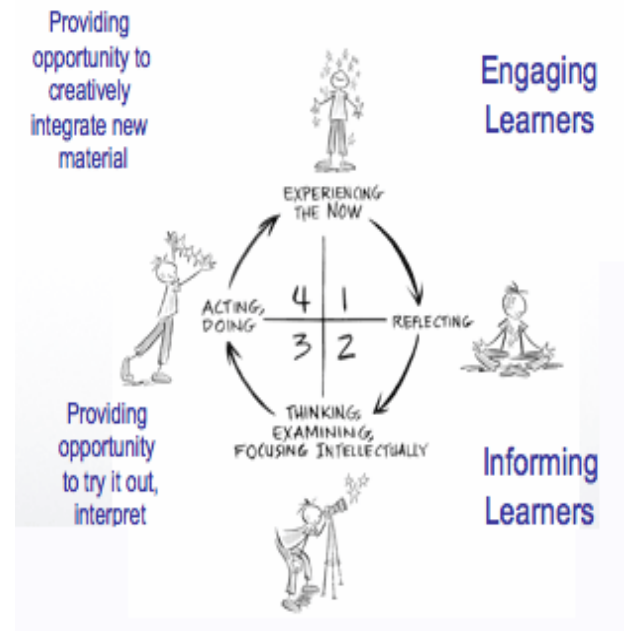
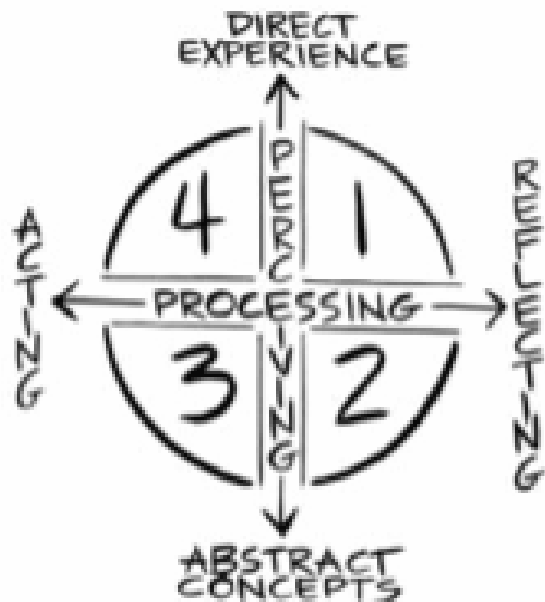
- Bernice McCarthy - 4MAT (www.aboutlearning.com)
- Soloman/Felder - Index of Learning Style Inventory (<http://www.engr.ncsu.edu/learningstyles/ilsweb.html>)
- Jean Piaget - Genetic Epistemology
- Carl Rogers – Experiential Learning
- B.F. Skinner – Operant Conditioning
- Howard Gardner – Multiple Intelligences



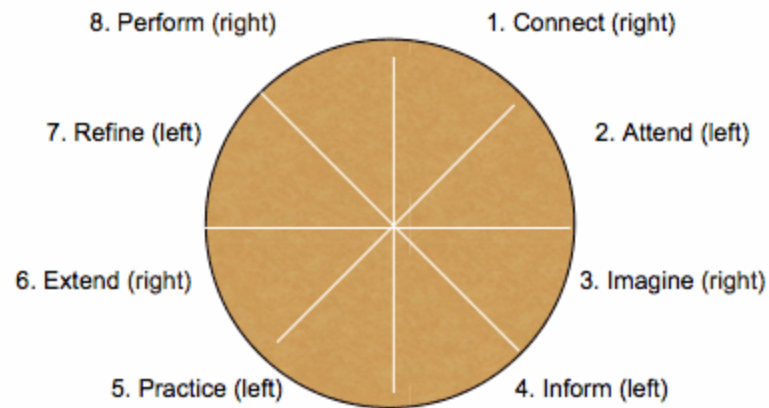
VAK Learning Style

- Three Types of Learners
 - Verbal
 - Auditory
 - Tactile/Kinesthetic

Bernice McCarthy's 4MAT System



Bernice McCarthy's 4MAT System



Left Brain/Right Brain





Howard Gardner's Multiple Intelligences

- Stanford-Binet IQ Test
 - Verbal/Linguistic
 - Math/Logic
 - Multiple Intelligences
 - Spatial
 - Musical
 - Body Kinesthetic
 - Interpersonal
 - Intrapersonal
 - (Naturalist)
-



In Summary

- Teaching is Nothing More than:
 - Adapting your Teaching Style
 - To a variety of Learning Styles
 - Without letting your own over-ride.

- Now, go home, get plenty of sleep and hit the road running. They'll be chasing you!!!